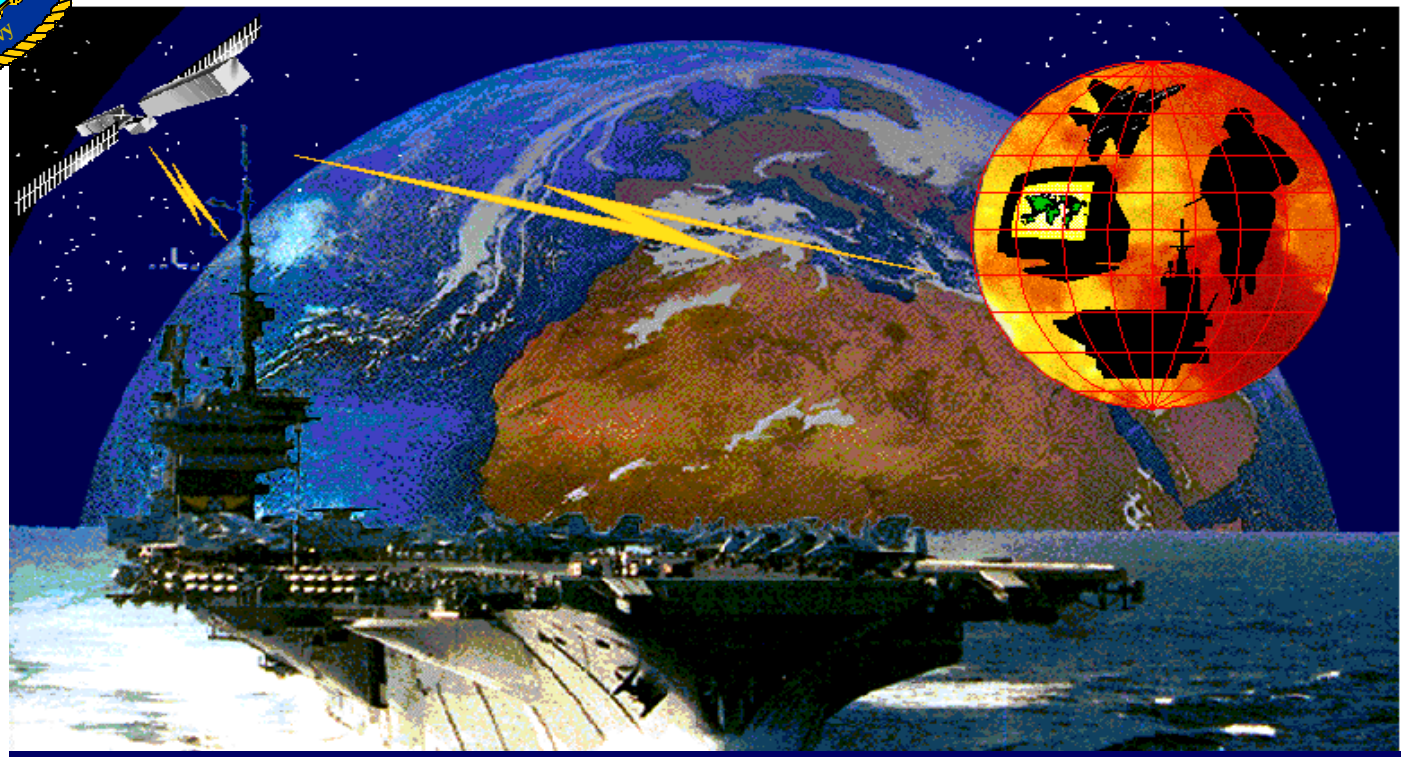
Naval C4ISRT for the 21st Century



CAPT Larry Stack (N6KB)

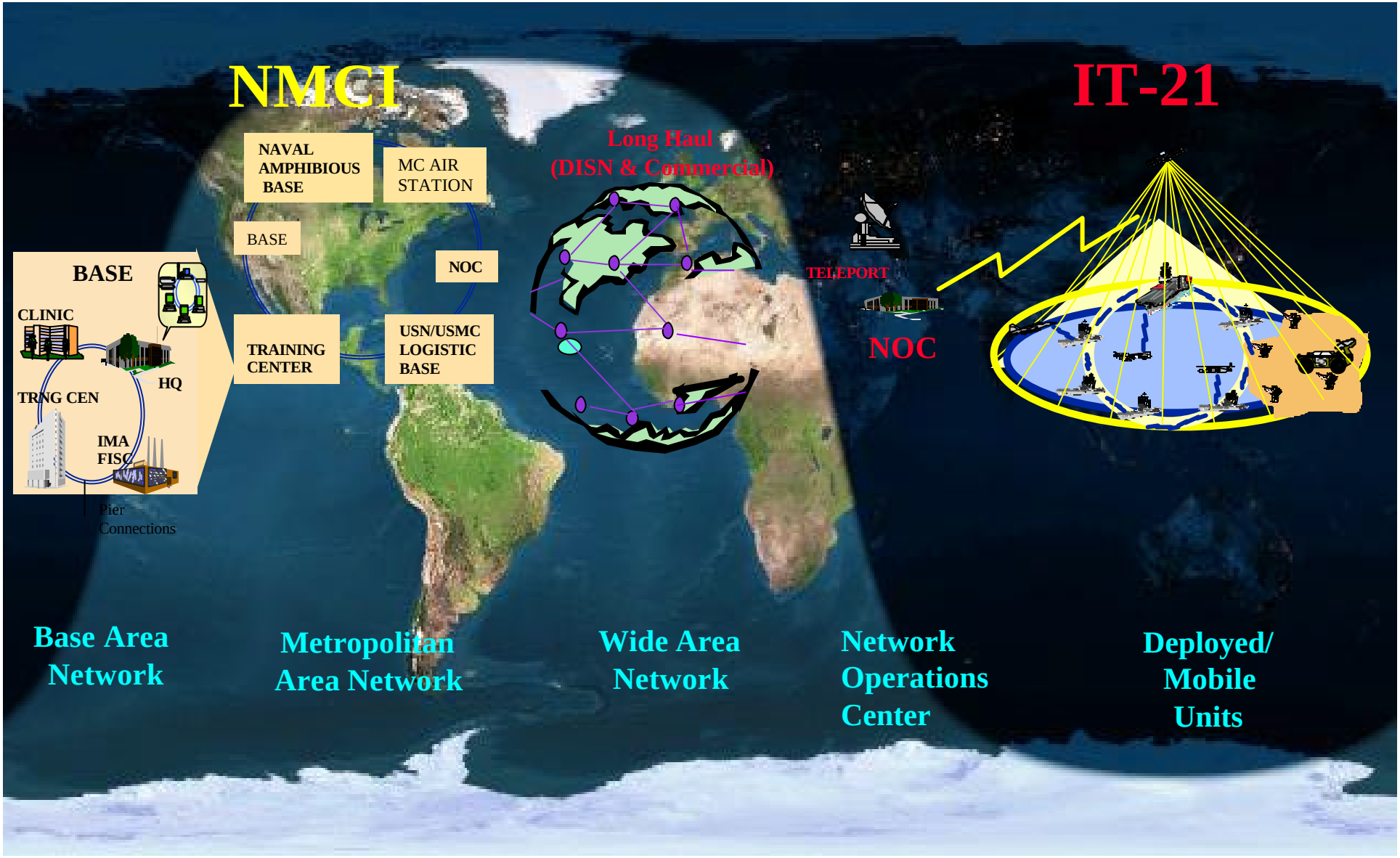
4th Annual 1999 Expeditionary Warfare Conference

2 November 1999

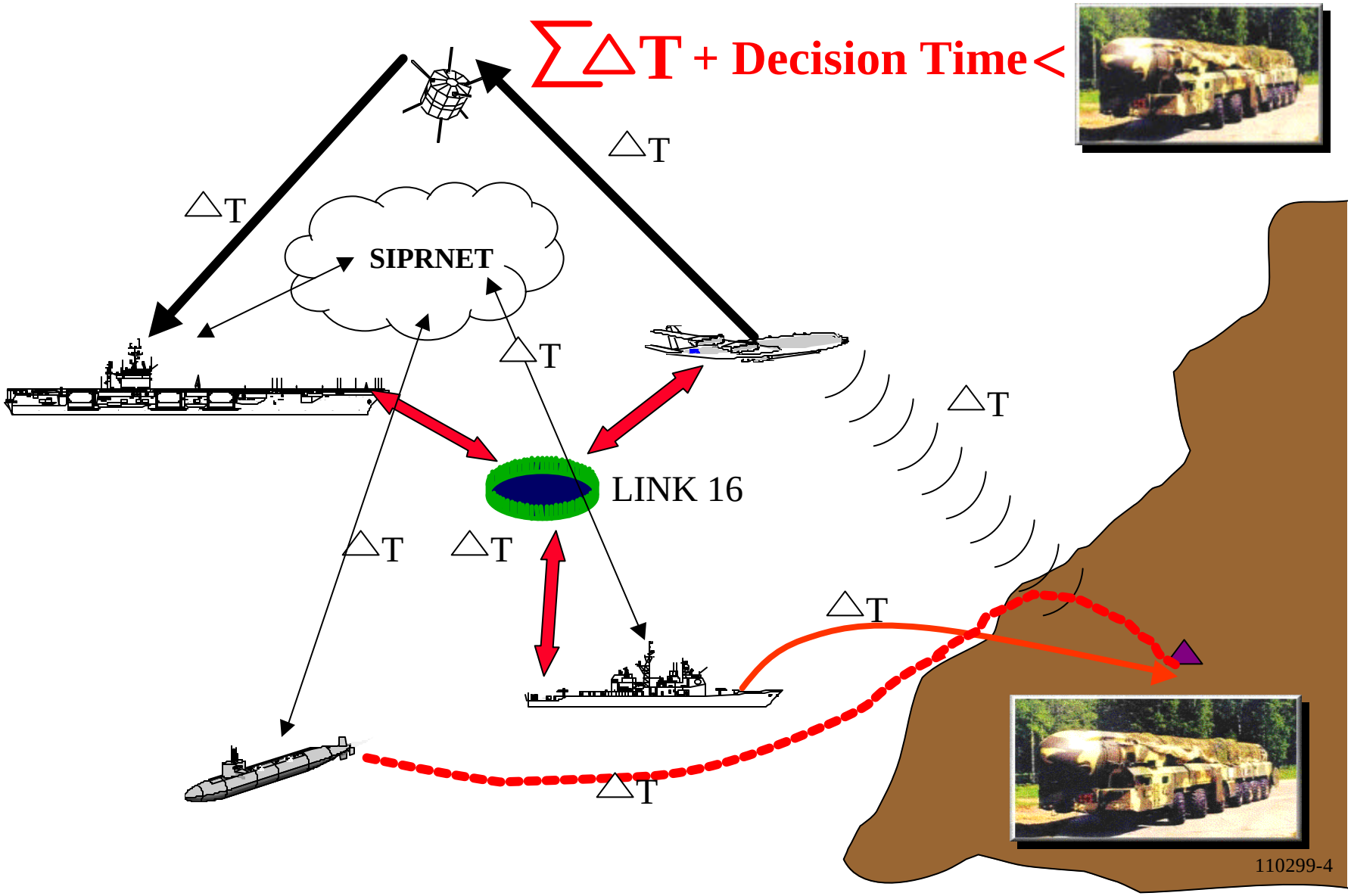
N6 - We Enable the IT Infrastructure that Ensures Combat Superiority

- **Building the Networks**
  - Navy Marine Corps Intranet
  - IT-21
  - Security & Assurance
  - Data Links
  - Bandwidth
- **Intelligence, Surveillance, Reconnaissance and Targeting (ISRT)**
  - Space/SATCOM
  - UAVs / TCS
  - Combat ID
  - Integrated Broadcast Service
  - TENCAP Programs
- **Building and Sharing the Picture**
  - Common Operational Picture
  - GCCS-M

Navy - Global, Secure, End-to-End Capability

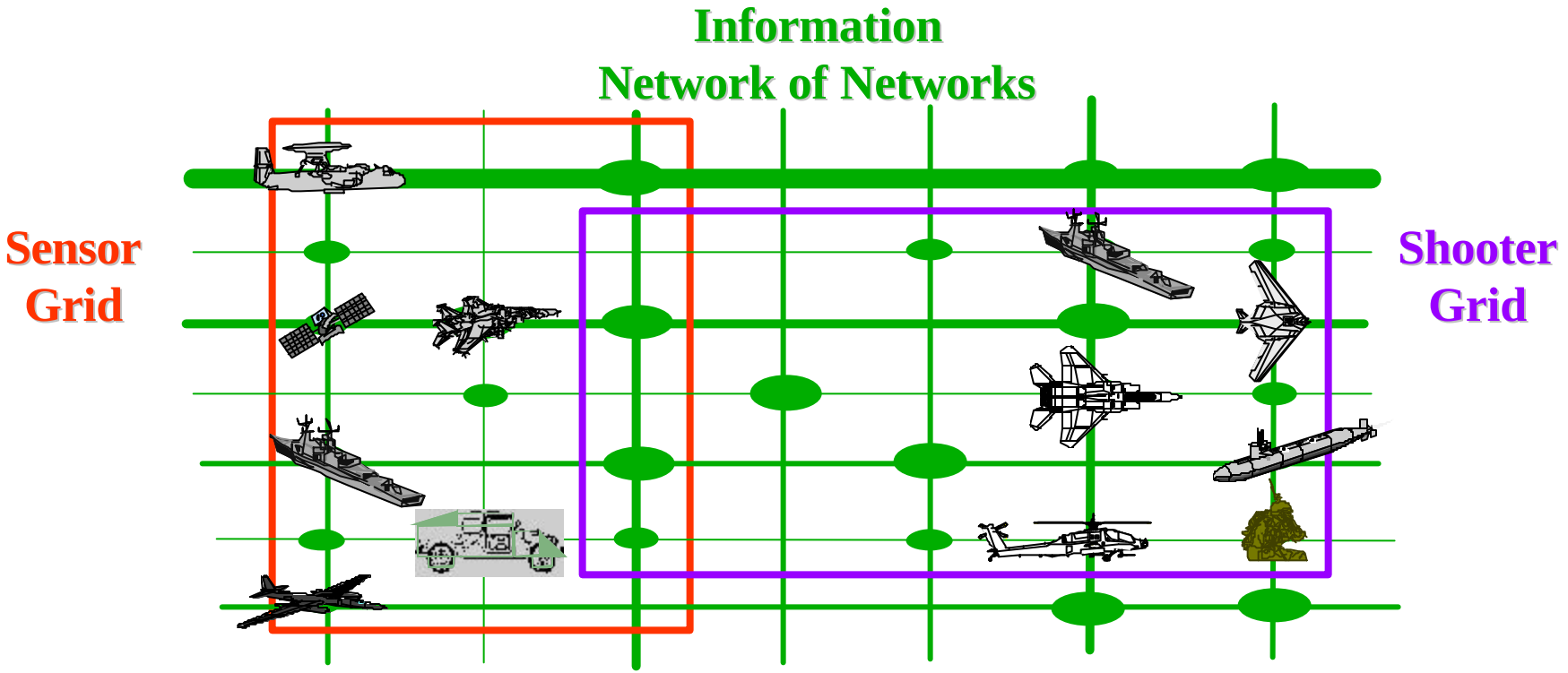


Today's Challenge: Time To Observe, Orient, Decide and Act



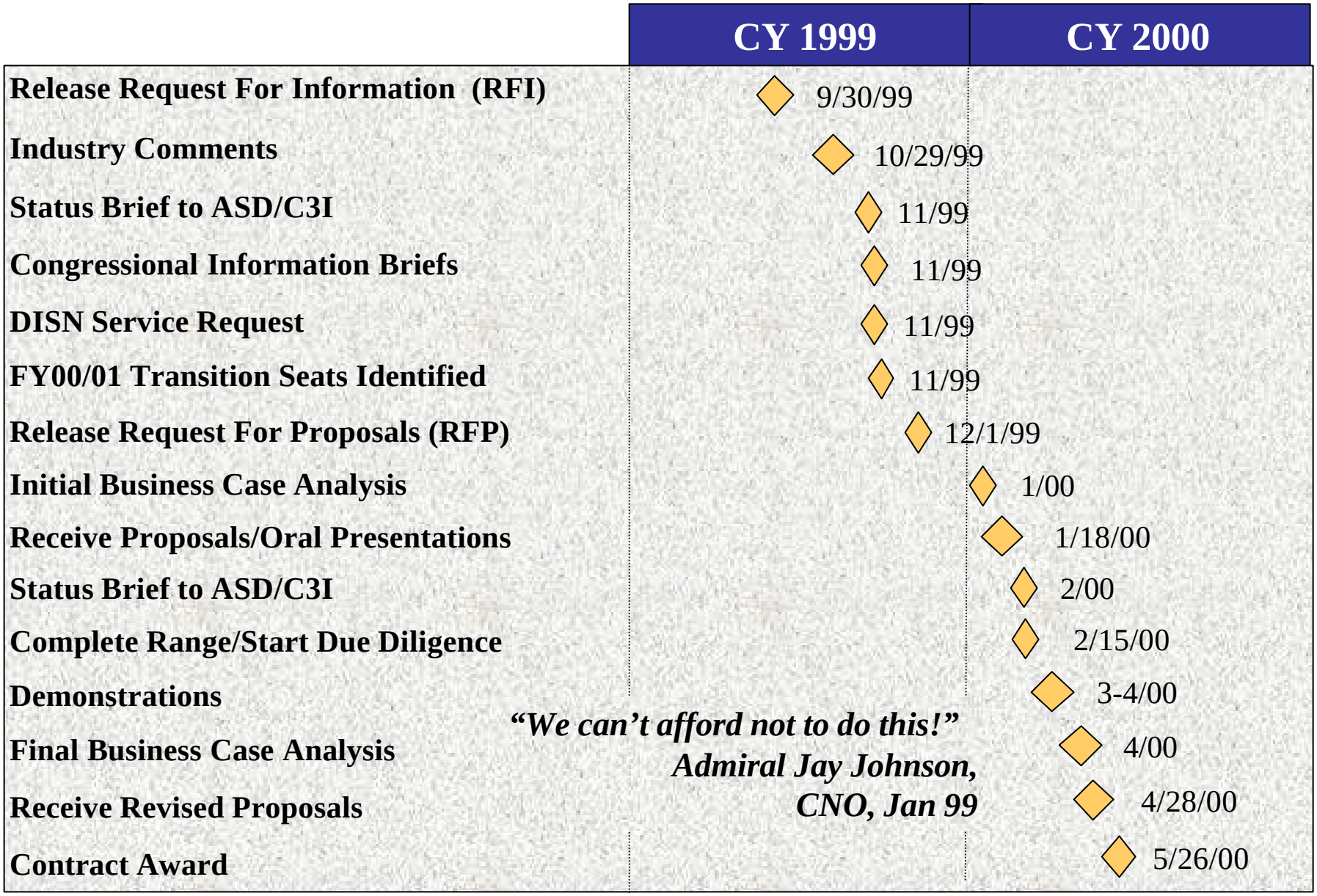
Tomorrow's Navy - Network Centric Warfare

"…it's a fundamental shift from what we call Platform Centric Warfare to something we call Network Centric Warfare." ***- CNO, April 97 USNA***

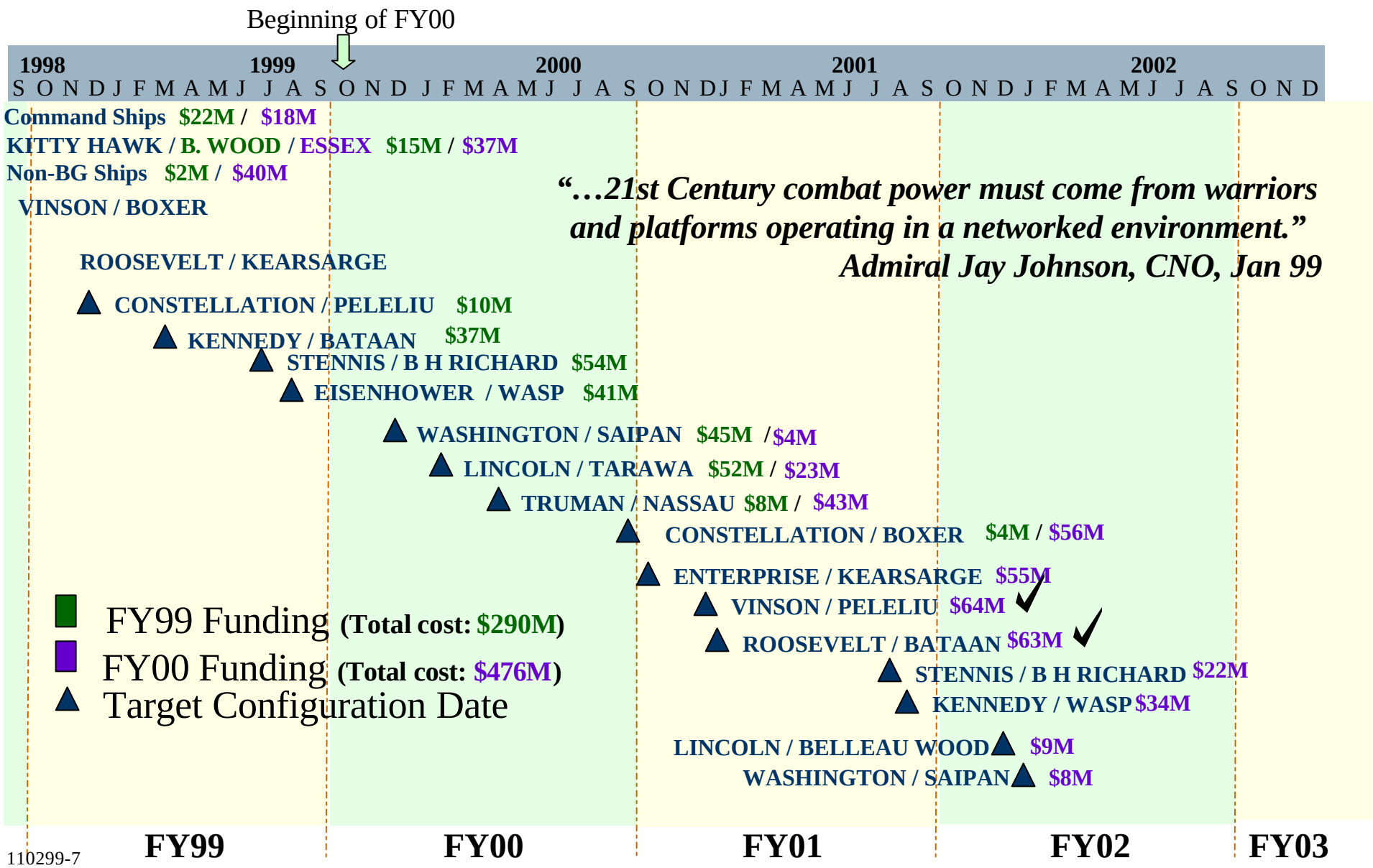


- ***Situational Awareness***
- ***Speed of Command***
- ***Close Coordination and Collaboration***

N/MCI Target Schedule



IT-21 Implementation



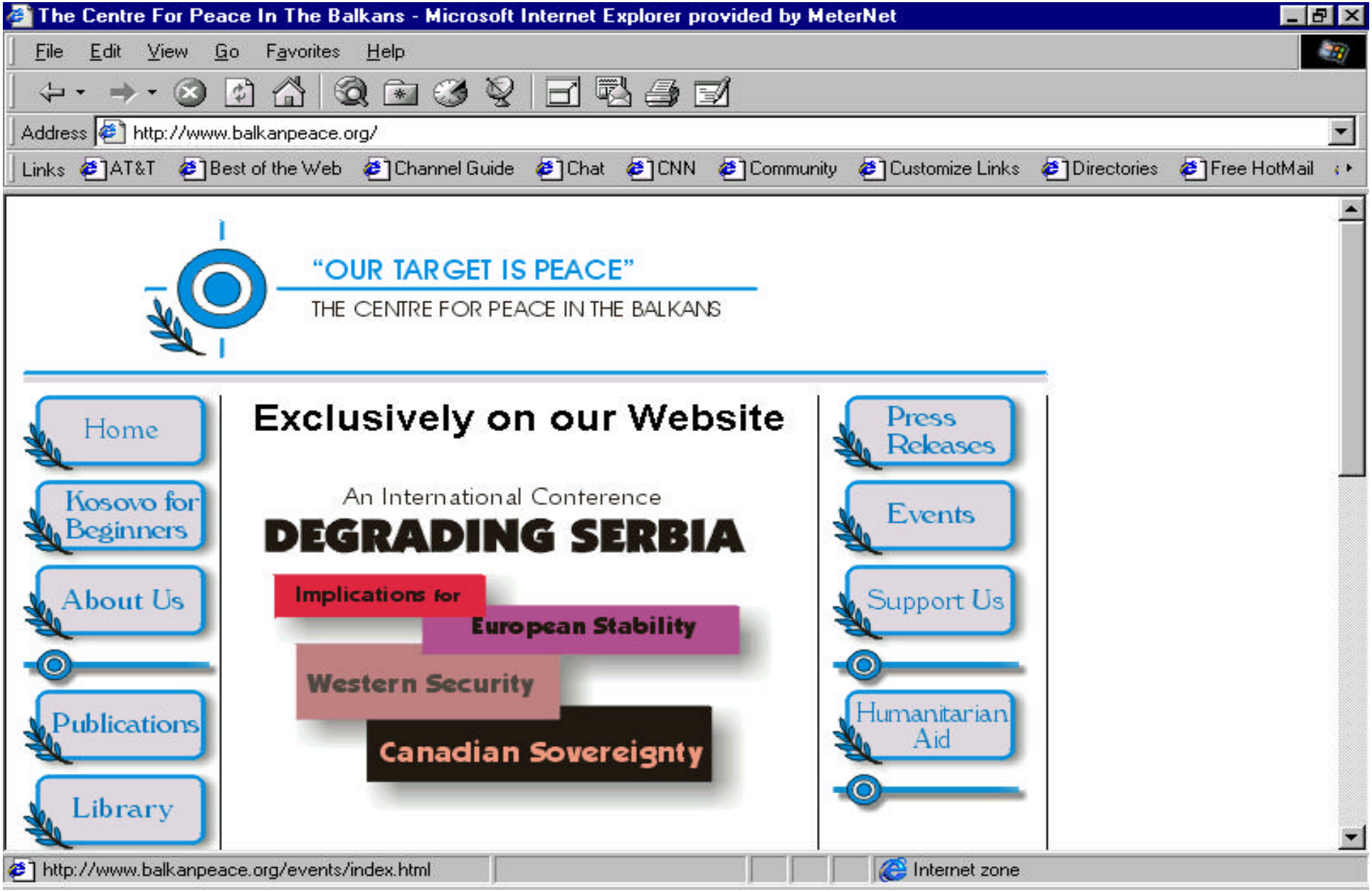
110299-7

Security & Assurance Architecture

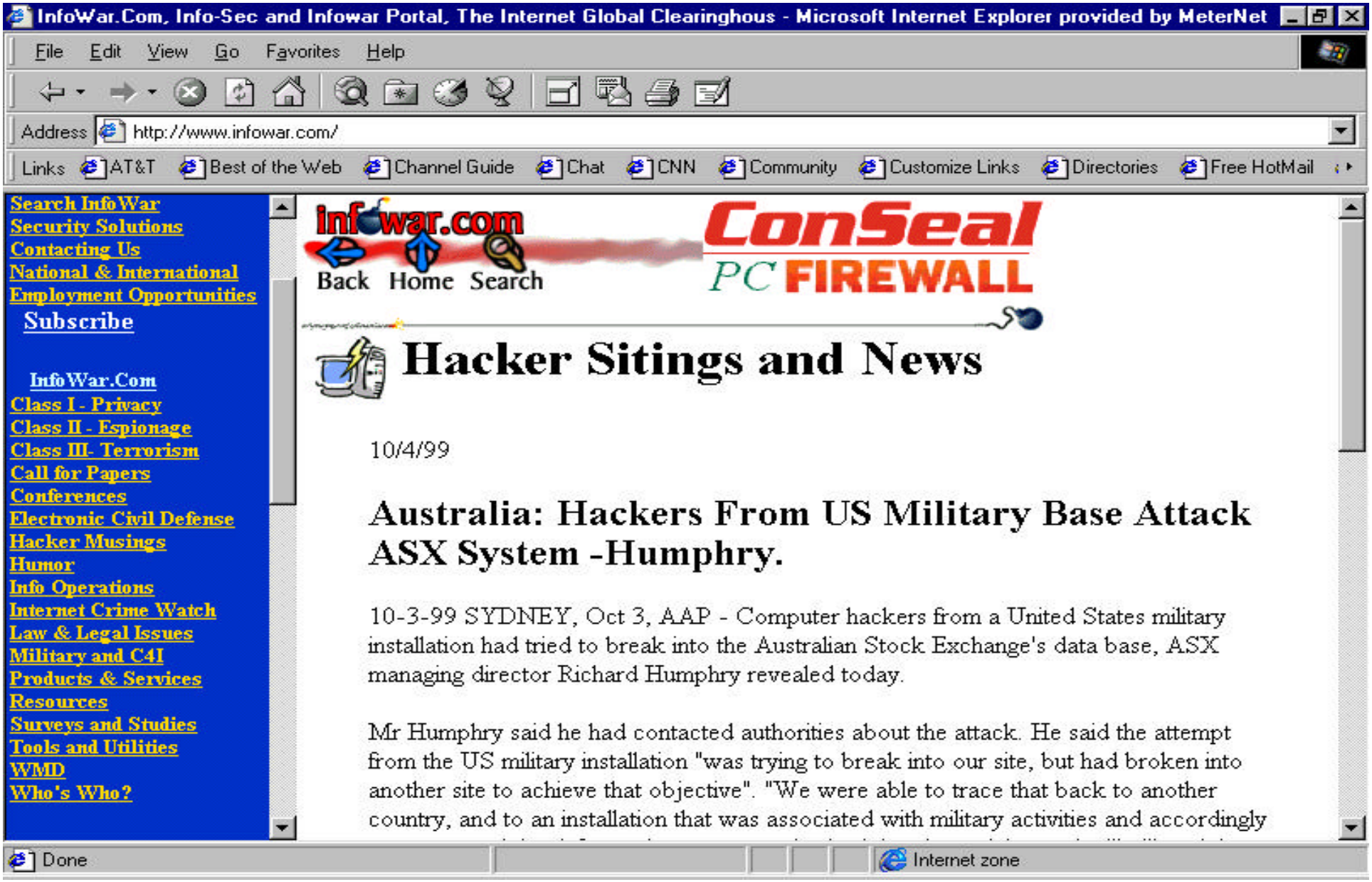
Defense in Depth: Global, Regional, Base and Local Security & Assurance

Cyberspace or Infospace - The New Maneuvering Ground
100M for a New Platform or 100M to Groom Hackers?

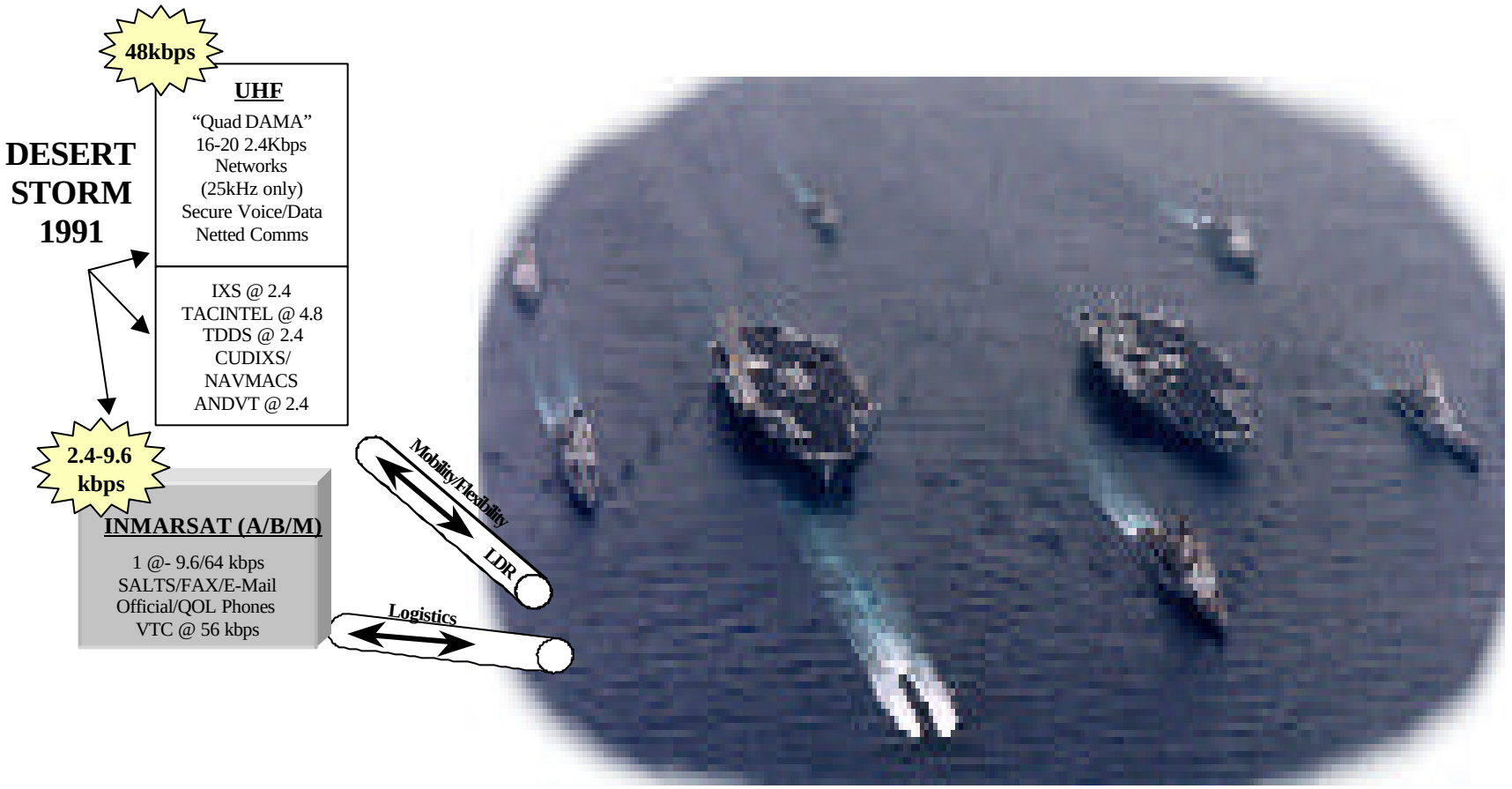
Win the Heart, Win the Mind...Win the War?



MORE

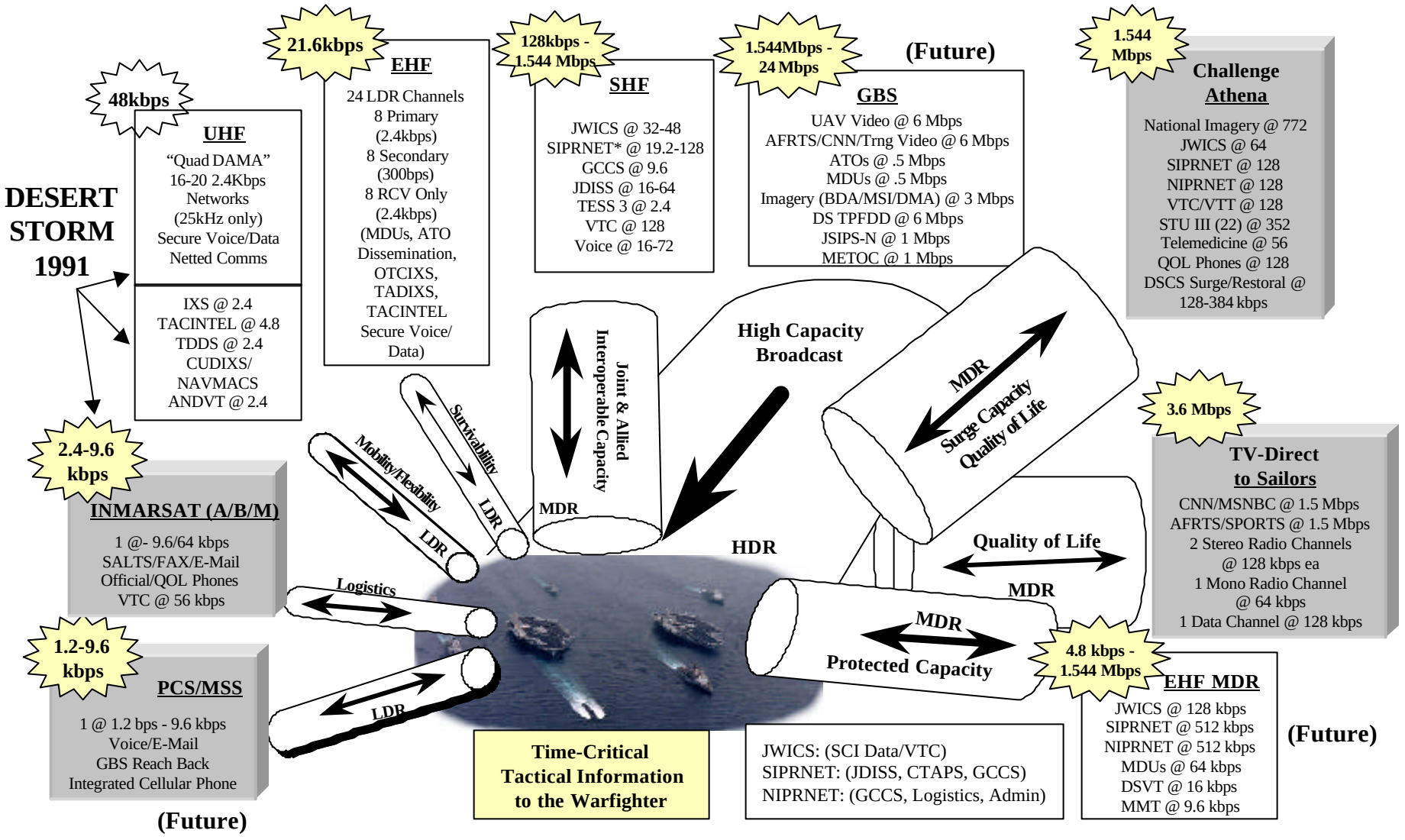

InfoWar.Com, Info-Sec and Infowar Portal, The Internet Global Clearinghous - Microsoft Internet Explorer provided by MeterNet
File Edit View Go Favorites Help
Address http://www.infowar.com/
Links AT&T Best of the Web Channel Guide Chat CNN Community Customize Links Directories Free HotMail
Search InfoWar
Security Solutions
Contacting Us
National & International
Employment Opportunities
Subscribe
InfoWar.Com
Class I - Privacy
Class II - Espionage
Class III- Terrorism
Call for Papers
Conferences
Electronic Civil Defense
Hacker Musings
Humor
Info Operations
Internet Crime Watch
Law & Legal Issues
Military and C4I
Products & Services
Resources
Surveys and Studies
Tools and Utilities
WMD
Who's Who?
infowar.com
Back Home Search
ConSeal
PC FIREWALL
Hacker Sitings and News
10/4/99
Australia: Hackers From US Military Base Attack ASX System -Humphry.
10-3-99 SYDNEY, Oct 3, AAP - Computer hackers from a United States military installation had tried to break into the Australian Stock Exchange's data base, ASX managing director Richard Humphry revealed today.
Mr Humphry said he had contacted authorities about the attack. He said the attempt from the US military installation "was trying to break into our site, but had broken into another site to achieve that objective". "We were able to trace that back to another country, and to an installation that was associated with military activities and accordingly
Done
Internet zone

Bandwidth…Before



Commercial Systems in Shaded Boxes

Bandwidth…
Coming to a Theater Near you



Commercial Systems in Shaded Boxes

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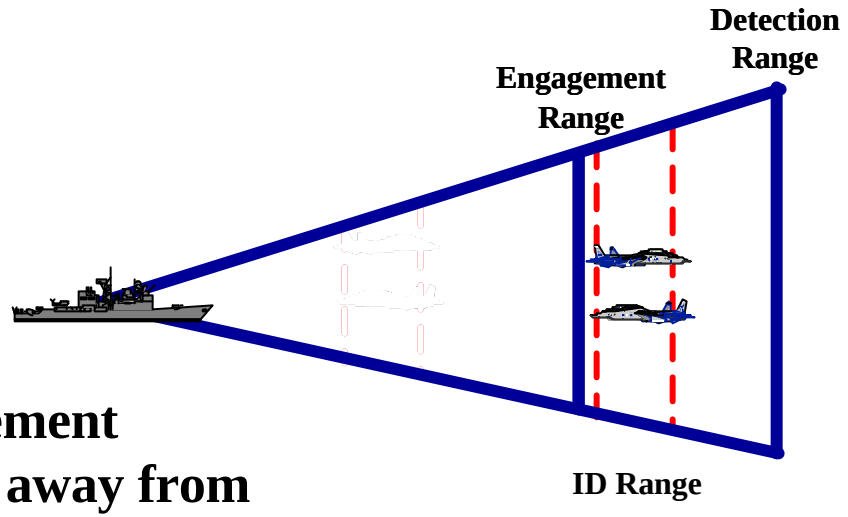
Intelligence, Surveillance, Reconnaissance, and Targeting

Combat Identification

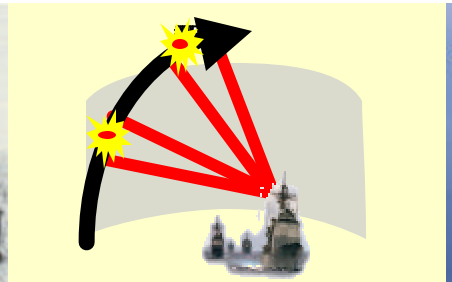
- Non-cooperative
- Indirect/EW
- C3/Datalinks
- Cooperative
- Procedural

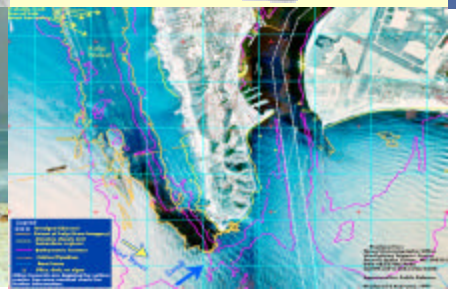


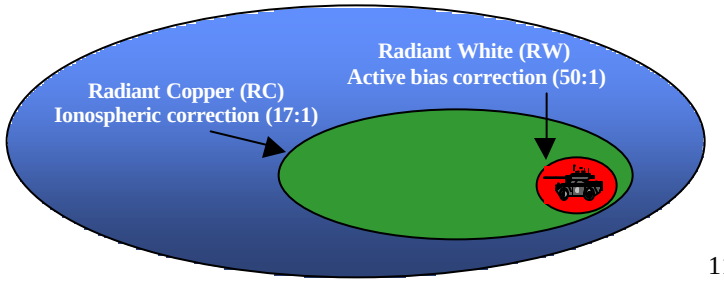
- Focus is to support power projection
- Avoid fratricide
- Identify unknowns
- Positive identification needed for engagement
- Longer range precision weapons - move away from visual ID (Electronic finger printing/imagery/IR)

TENCAP Programs

Warfighter's Concerns	RADIANT Projects	Description
• Littoral ASW / Counter-Mine	BRONZE	Employs hyperspectral (operational) and Ultra-low light imagery (under development) to detect undersea targets
• TBMD	GOLD	Overhead warning & cueing to AEGIS fire control
• Precision Strike	ELM	Improve targeting data from national & theater sensors
	WHITE	50:1 improvement in active bias correction
	COPPER	17:1 improvement in ionospheric correction
• Battlespace Characterization	BRASS	Non-imaging IR for intelligence and BHA
	CLEAR	Hyperspectral imagery to characterize environment







Littoral Antisubmarine & Countermine Warfare

- **Operational show stoppers**
  - **Threatens logistics by sea**
  - **Threatens amphibious power projection**
  - **Threatens mine counter measure operations**

TRIPS is operational, ULLI under development

- **RADIANT BRONZE investigating hyper-spectral (TRIPS) and ultra-low light imagery (ULLI) technology for undersea targets**
- **Providing the technology for future overhead systems**

Precision Strike

- **Can’t use the weapons if you can’t target them**
- **Evolution to predominantly mobile targets**
- **Precision weapons & smaller warheads require better information fusion**

- **RADIANT ELM investigating the capability of various national, theater and organic sensors to precisely locate targets**

Building and Sharing the Picture:
Visualization of the Common Operational Picture

NRT Air Data

TADIL A
TADIL B
TADIL J

NRT Threat / Warning Data

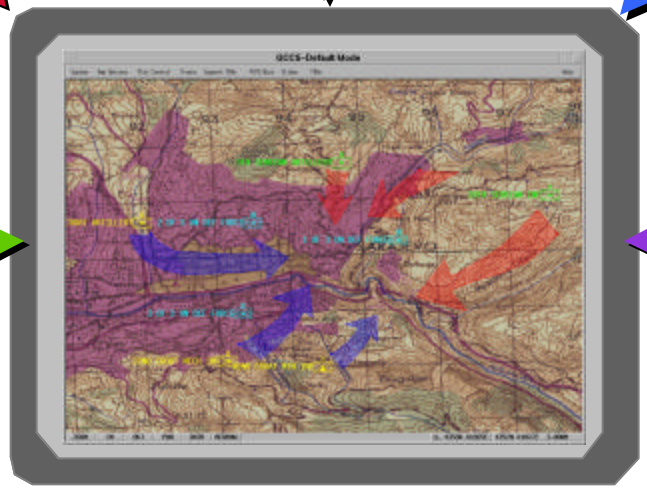
TRAP / TDDS
TIBS
TBMD
NRTI / NRTD

NRT Ground & Maritime Data

Naval Component Cdr
Ground Component Cdr
Position Locating
Reporting Systems /
JSTARS / MTI

Supporting Data Bases

Intel OOB / Facilities
Imagery
Targets
Combat Support



Supporting Tools

Air Route Structure
Airspace Mgmt Info
SAM Lethal Range Rings
Collection Management
Environmental Data

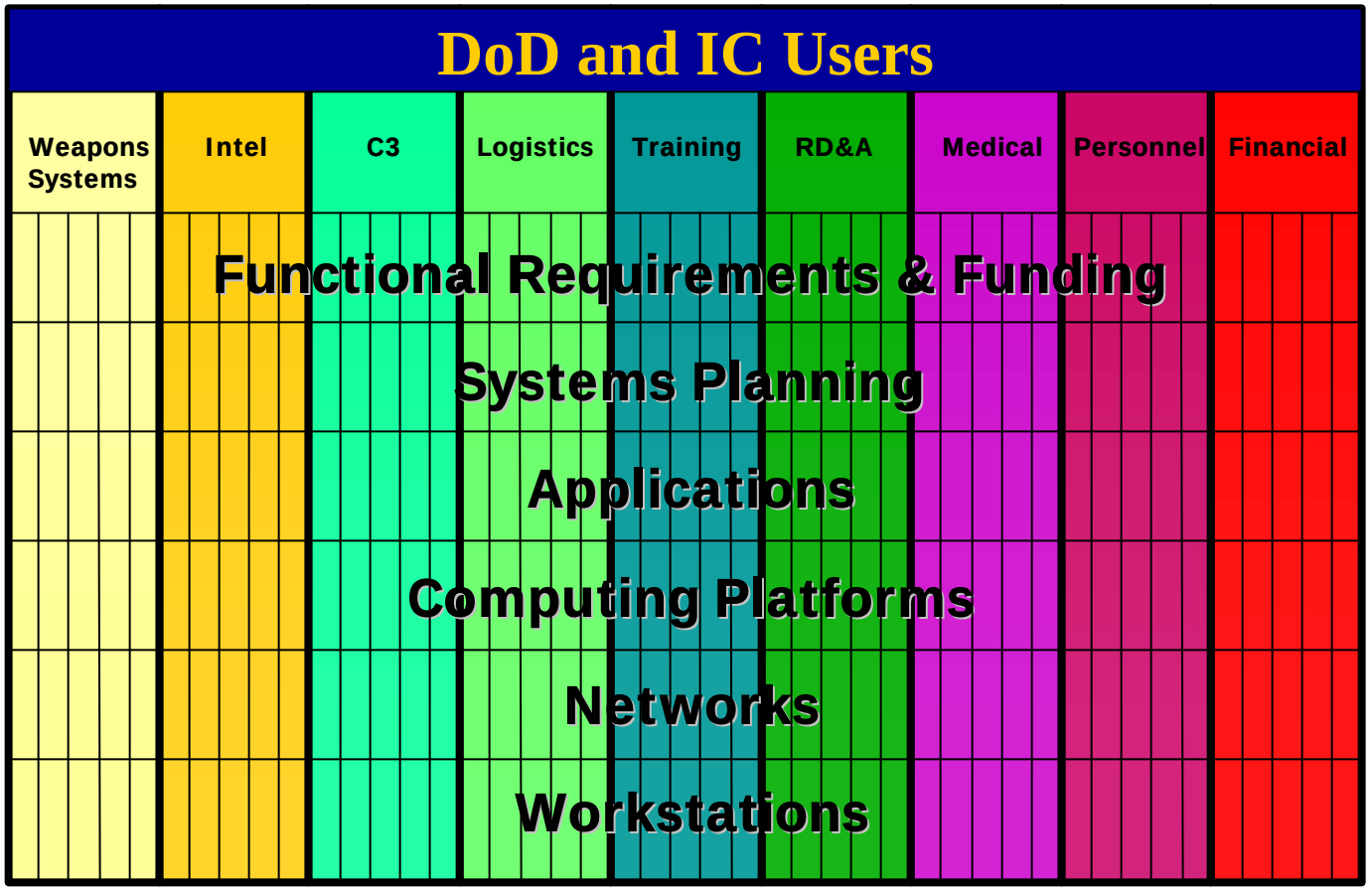
Common Chart Display

Integrated Information Base - CRT & Large Screen Displays

Current DoD and Intelligence Community IT Reality

Functional organizations and Services deliver solutions through functional stovepipes

Fragmented and duplicative $15B annual IT Infrastructure expenditure



Global Information Grid

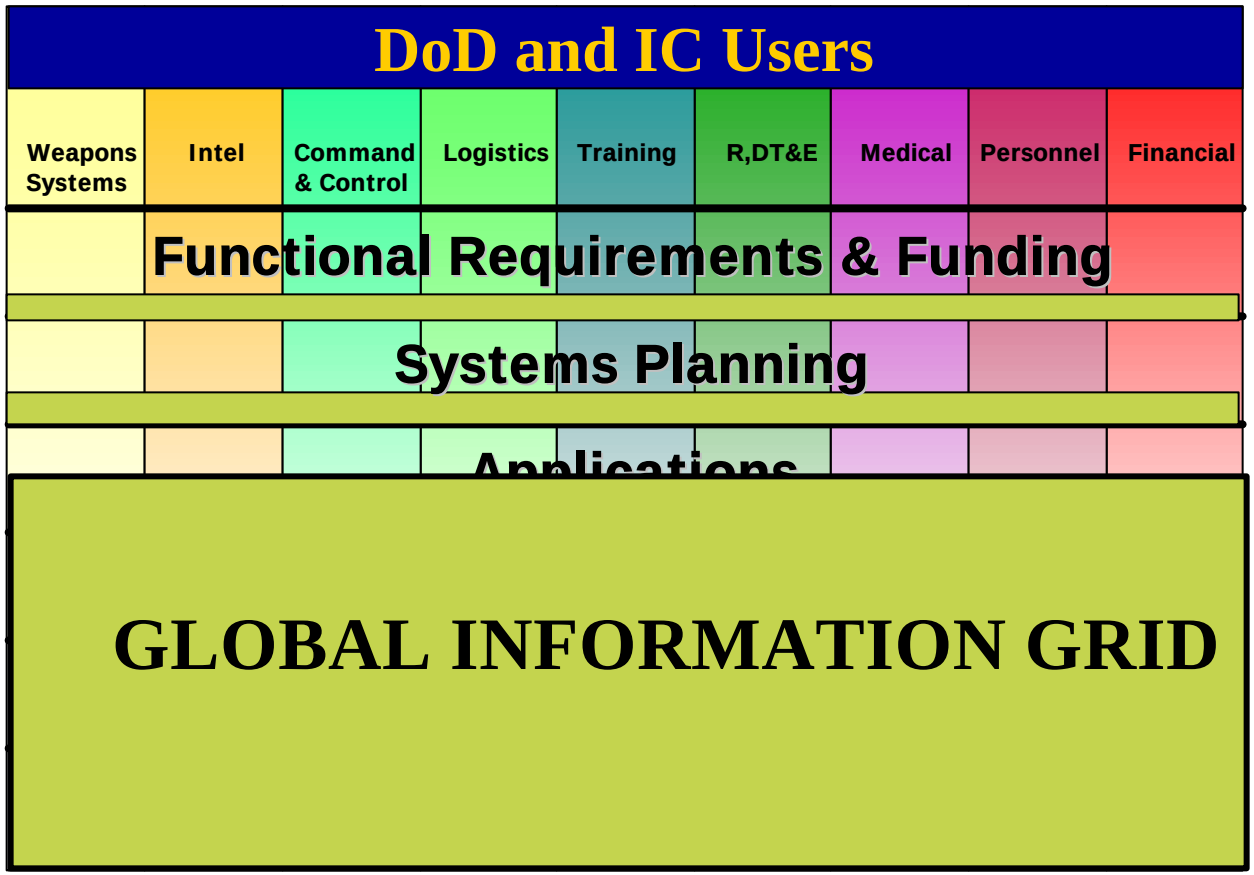
The globally interconnected, end-to-end set of information capabilities, associated processes and personnel for collecting, processing, storing, disseminating and managing information on demand to warfighters, policy makers, and support personnel. The GIG includes all owned and leased communications and computing systems and services, software (including applications), data, security services and other associated services necessary to achieve Information Superiority. It also includes National Security Systems as defined in section 5142 of the Clinger-Cohen Act of 1996. The GIG supports all Department of Defense, National Security, and related Intelligence Community missions and functions (strategic, operational, tactical and business), in war and in peace. The GIG provides capabilities from all operating locations (bases, posts, camps, stations, facilities, mobile platforms and deployed sites). The GIG provides *interfaces to coalition, allied, and non-DoD users and systems.*

GIG Solution

Functional applications utilize a common global computing and communications capability

Consistent with industry best practices

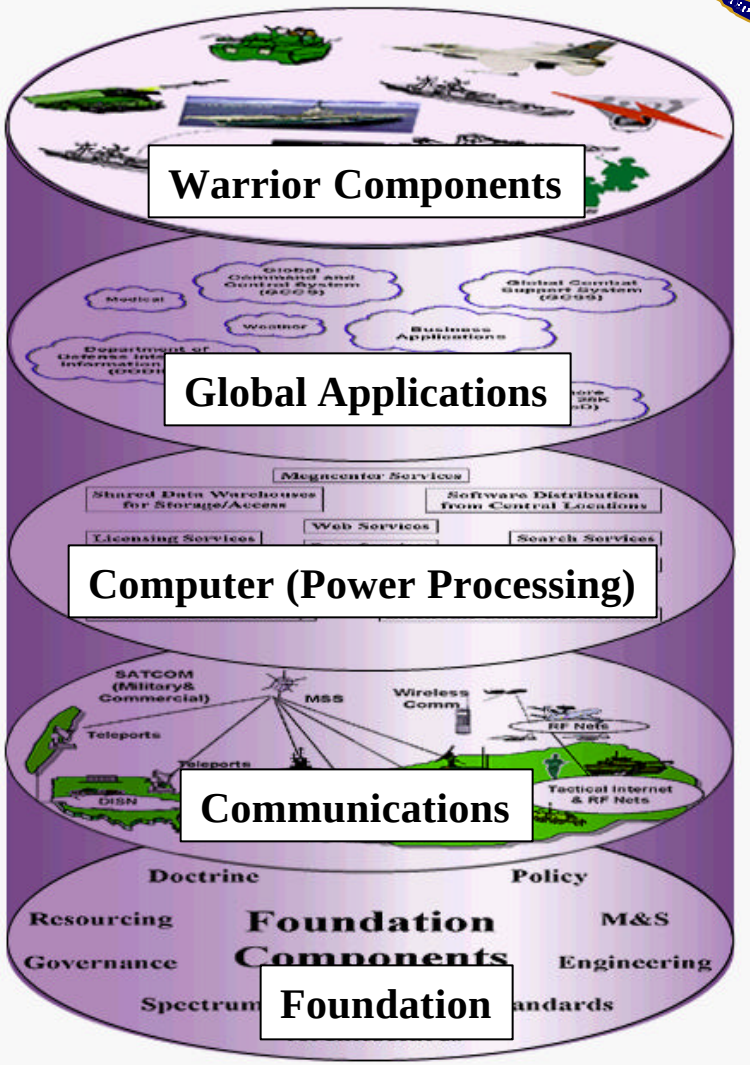
Customers gets more secure, more interoperable systems



The Vision: Global Information Grid

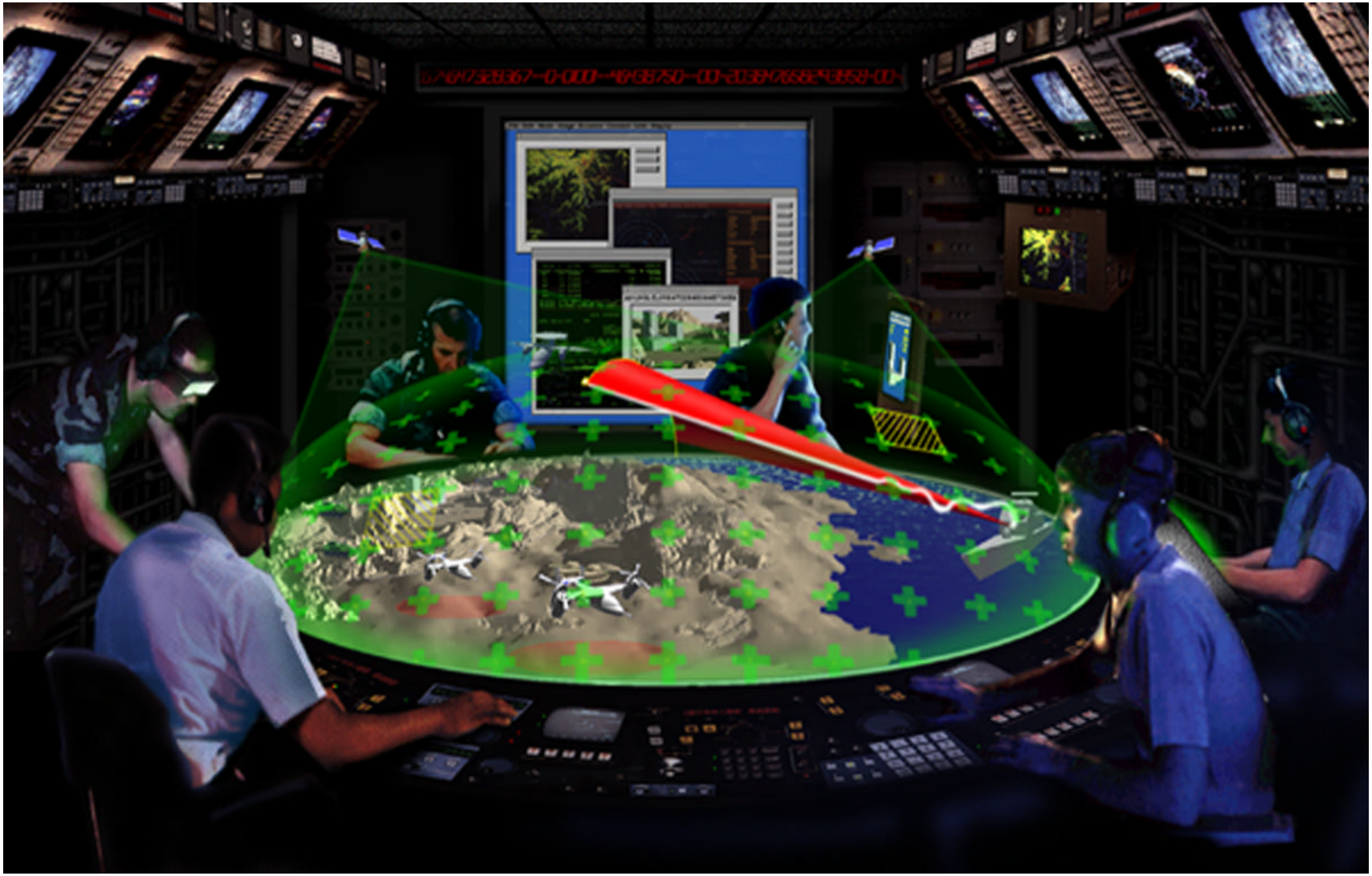
The GIG Vision

- A single **secure** Grid providing seamless **end-to-end** capabilities to all **warfighters**
- Joint, **high capacity** netted operations
- **Fused** with weapons systems
- Supporting strategic, operational, tactical, and base/post/camp/station **levels**
- "Plug and Play" **interoperability** guaranteed
  - For US, Allied, and Coalition users
- Tactical **fusion** a reality
- Bandwidth **on demand**
- **Defense in Depth** against all threats



Assured, Interoperable Communications

The Future is Here



Summary

- As technology changes, so must our culture and processes
- Networking operators, sensors, weapons systems, information and knowledge *across* the CINC's, Services and Agencies
- Overarching Architectures - ending the IT stovepipes
- Fleet feedback - Shortened timelines and improved situational awareness
- N6 is the C4ISRT enabler

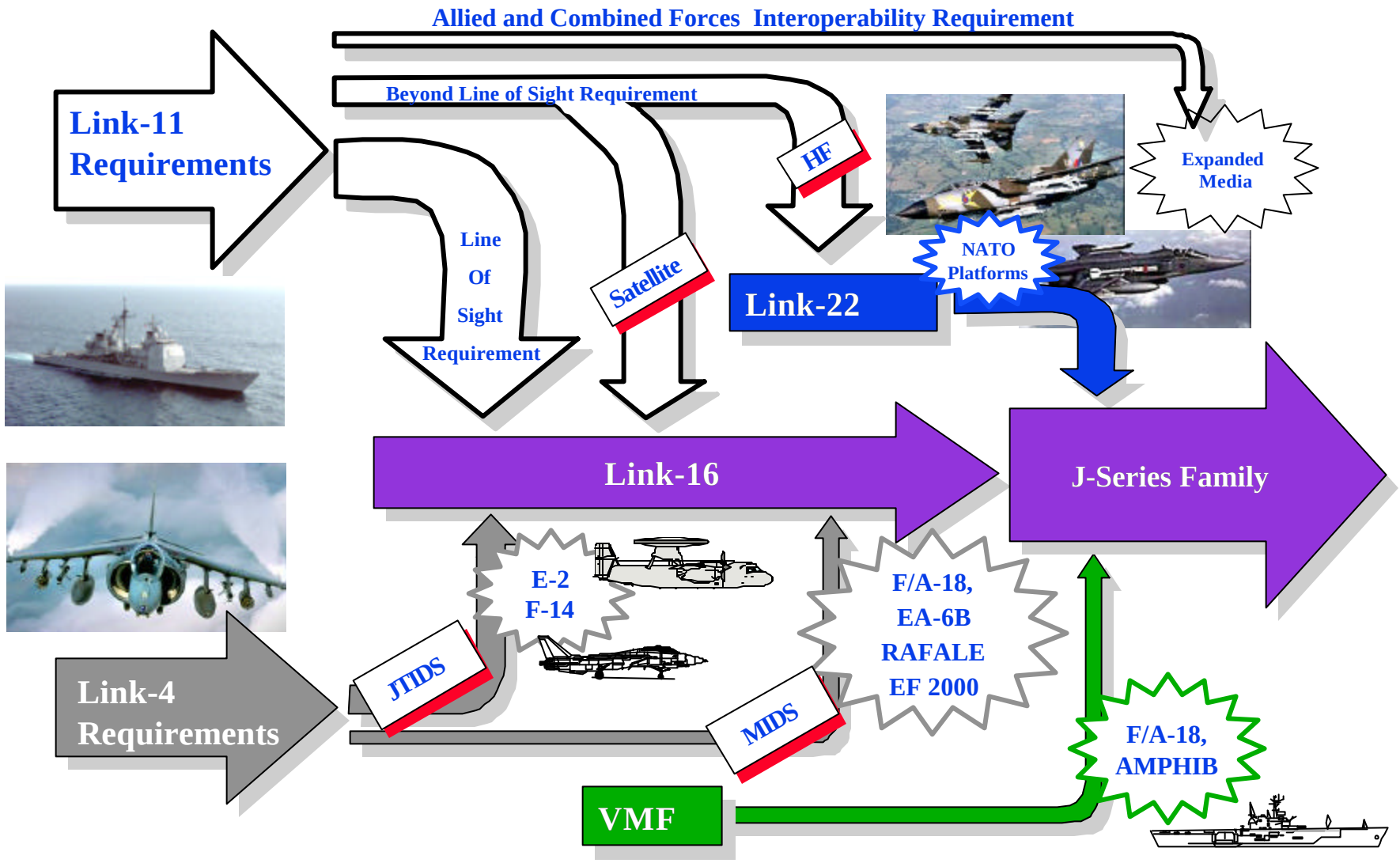
"The only thing harder than getting a new idea into a military mind is getting an old one out"

-- B.H. Liddle Hart --

Questions

Back-ups

Data Link Migration Plan



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Cyberspace?

N6 Focus

DRIVERS

- Emerging Operational Concepts
  - Network Centric Operations
  - OMFTS
  - FBE's
- Precision and Speed
- Interoperability
- Training
- Security

ENABLERS

- Building the Networks
  - NMCI
  - IT-21
  - Security & Assurance
  - Data Links
  - Bandwidth
- Intelligence, Surveillance, Reconnaissance and Targeting (ISRT)
  - Space/SATCOM
  - UAVs / TCS
  - Combat ID
  - Integrated Broadcast Service
  - TENCAP Programs
- Building and Sharing the Picture
  - Common Operational Picture
  - GCCS-M

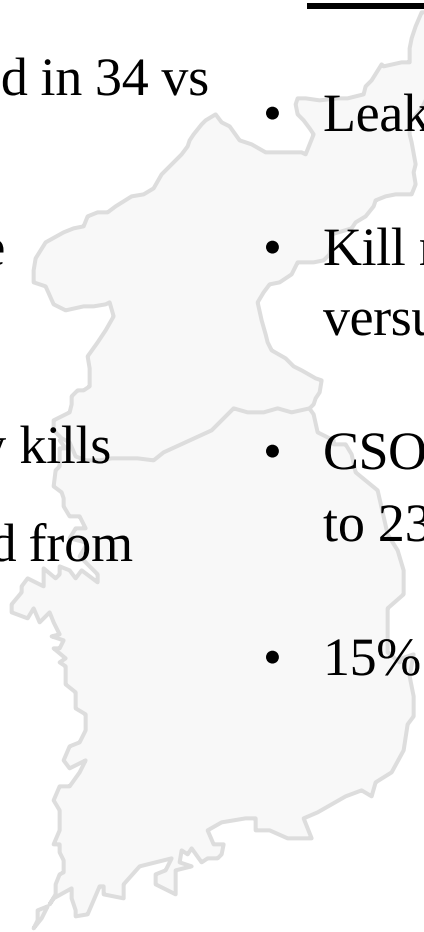
Space Functional Areas

Navigation	Natural Battlespace Characterization
• Global Positioning System (GPS) • Navigation Warfare (NAVWAR) • Navigation Sensor System Interface (NAVSSI) **Issue:** Working GPS modernization including NAVWAR	• Meteorology and Oceanography (METOC) • Shipboard Terminals (SMQ-11) • Indian Ocean (IO) imager satellite **Issue:** Maintain funding for IO imager to meet planned host on non-METOC spacecraft
Communications	**Intelligence, Surveillance, Reconnaissance & Targeting**
• Military and commercial satellite communications (SATCOM) • Shipboard SATCOM terminals • UHF Follow-On (UFO) • Mobile User Objective System (MUOS) • PMW-146 moving to PD-14/SSFA **Issue:** POM 02 procurement funding for MUOS	• Navy Space Surveillance • Theater Ballistic Missile Defense • Targeting, Engagement & Battle Damage Assessment • National sensor systems **Issue:** Navy NRO relationship

MUOS Strategy

- USN - UHF Acquisition Agent and Satellite System Expert (SSE)
- Current UHF constellation consists of FLTSATs and UFOs
  - UFO F2-F9 currently in-orbit - 10 year life
  - F-10 launch in November 1999
- UHF constellation is maturing
  - Drops to 70% availability around 2003
  - Rapidly degrades after 2008
- SSG approved Strategy
  - Launch F-11 in 2003 to maintain UHF availability above 70%
  - Mobile User Objective System (MUOS) planned IOC - 2007
    - » 45 day quicklook complete 28 Sept
    - » Analysis of Alternatives - Commenced in Oct

Operational Context: Korea



Strike

- Attrition objective achieved in 34 vs 64 hours
- Increased kills and kill rate
  - 35% more total kills
  - 50% more high priority kills
- Strike OODA loop reduced from 13.5 to 5.5 hours
- 46% fewer blue losses
  - 21 vs 34 aircraft
  - $650M savings

Counter Special Operations Forces

- Leakers reduced to 1 vs 10
- Kill rate limited by asset availability versus situational awareness
- CSOF decision cycle reduced from 43 to 23 minutes
- 15% fewer attack assets scrambled

JTRS

ISRT Prototype / Testbed

Theater Sensors (JSTARS, UAV)

+

Navy Organic Sensors (EP-3 / UAV)

=

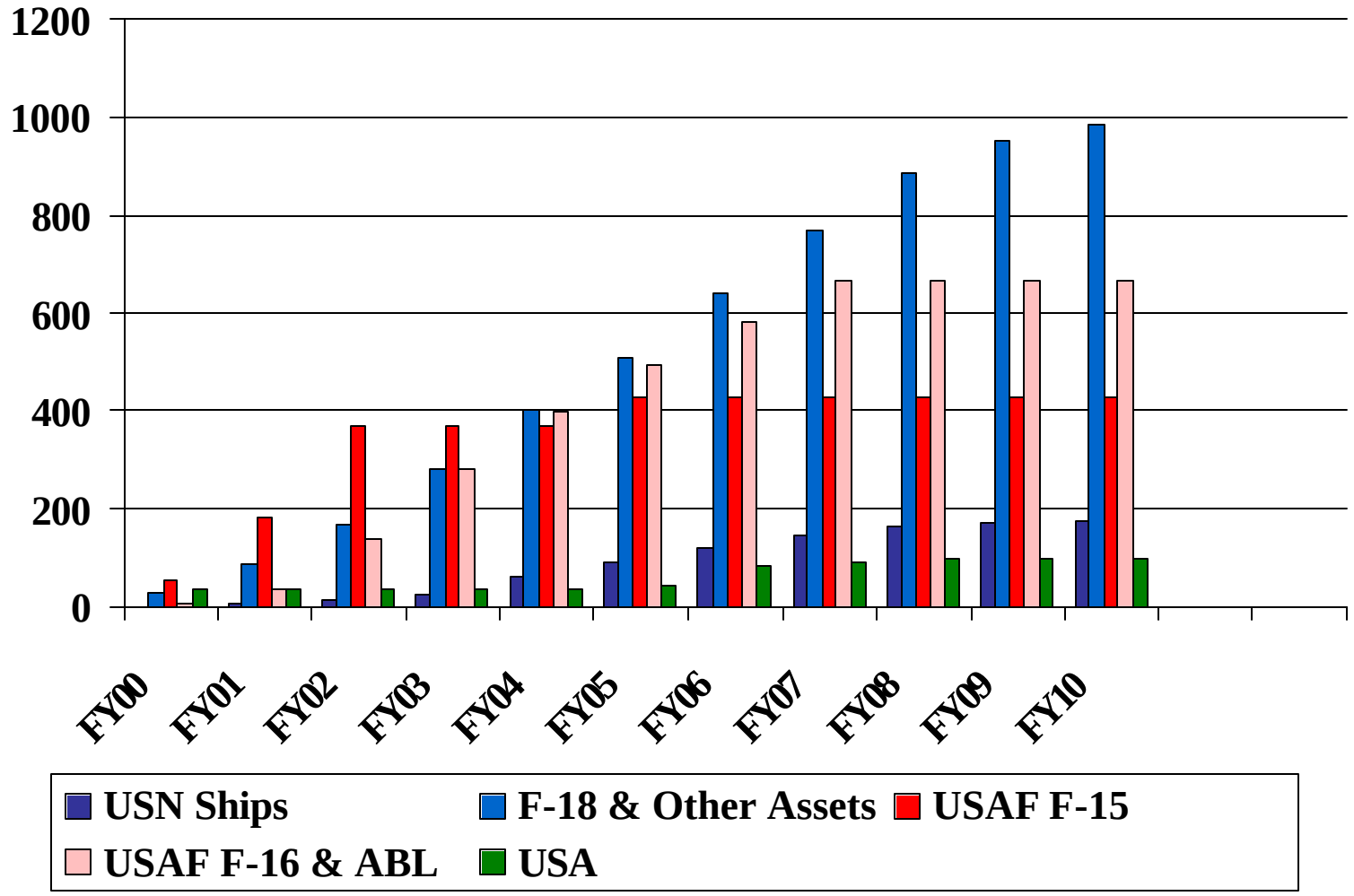
+

TES Forward (National Sensors)

ISRT Prototype / Testbed

. . . Providing Intelligence and Targeting Support <u>Using All Available Data</u>

MIDS Planned Production Quantities



Air Force leads in Link 16-capable fighters

N6 UAV Efforts

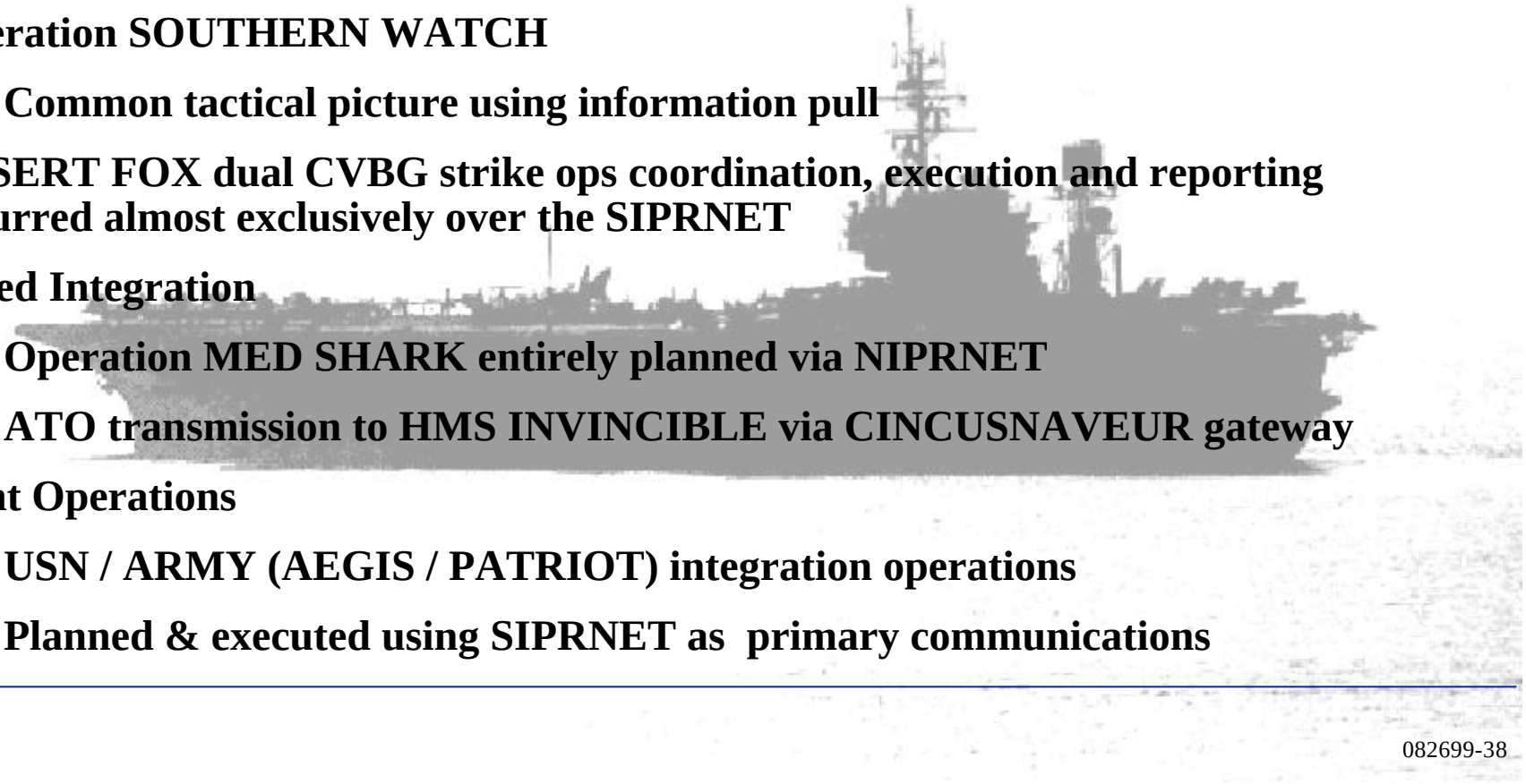
- SIGINT Sensors

ADD UAV'S

- Imagery
- National / Tactical Integration
- Integrate Data into JSIPS and BGPHES
- Airborne Communications Node

Operational Context: SWA LINCOLN/ENTERPRISE BG IT-21 Metrics

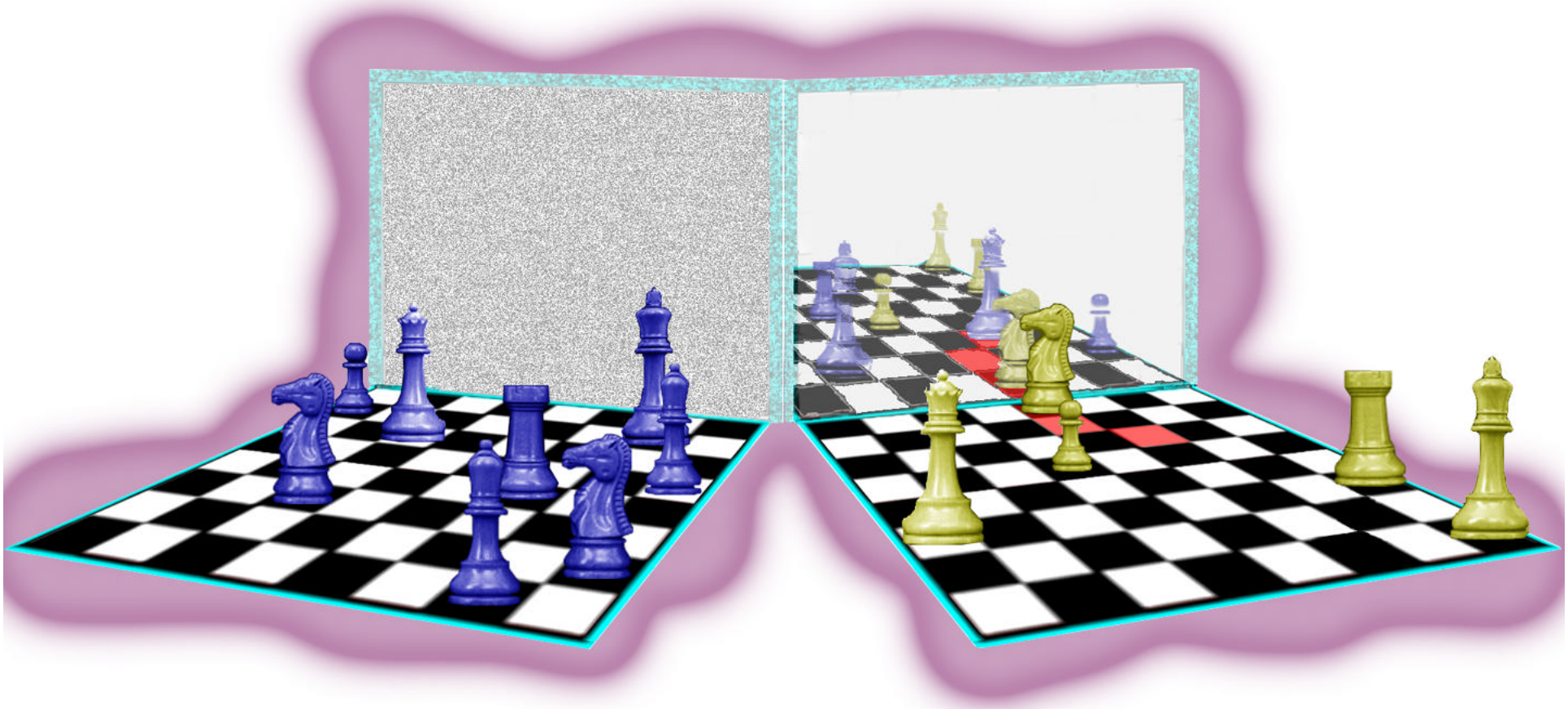
- **ASWEX 98-1**
  - **Web Centric ASW Net (WeCAN) & tactical chatrooms**
- **TLAM**
  - **Mission planning via Web page**
- **Operation SOUTHERN WATCH**
  - **Common tactical picture using information pull**
- **DESERT FOX dual CVBG strike ops coordination, execution and reporting occurred almost exclusively over the SIPRNET**
- **Allied Integration**
  - **Operation MED SHARK entirely planned via NIPRNET**
  - **ATO transmission to HMS INVINCIBLE via CINCUSNAVEUR gateway**
- **Joint Operations**
  - **USN / ARMY (AEGIS / PATRIOT) integration operations**
  - **Planned & executed using SIPRNET as primary communications**



Operational Context: Kosovo

- C6F Homepage - first location of on-line target materials in theater
- TLAM cycle compressed significantly using networks (JPN)
- Theater-National ISR collaboration excellent; need faster IMINT, used ELINT as targeting aid, need more COMINT analysis
- VTC has become premier Commanders' medium
- SIPRNET replaces message traffic as primary comms
- All units require high bandwidth -- need conformal antennas
- C4 architectures were vital. Also need:
  - Dedicated Information Management (IM) personnel in conjunction with IM plan and procedures in JTF
  - Web templates
  - Multi-level security

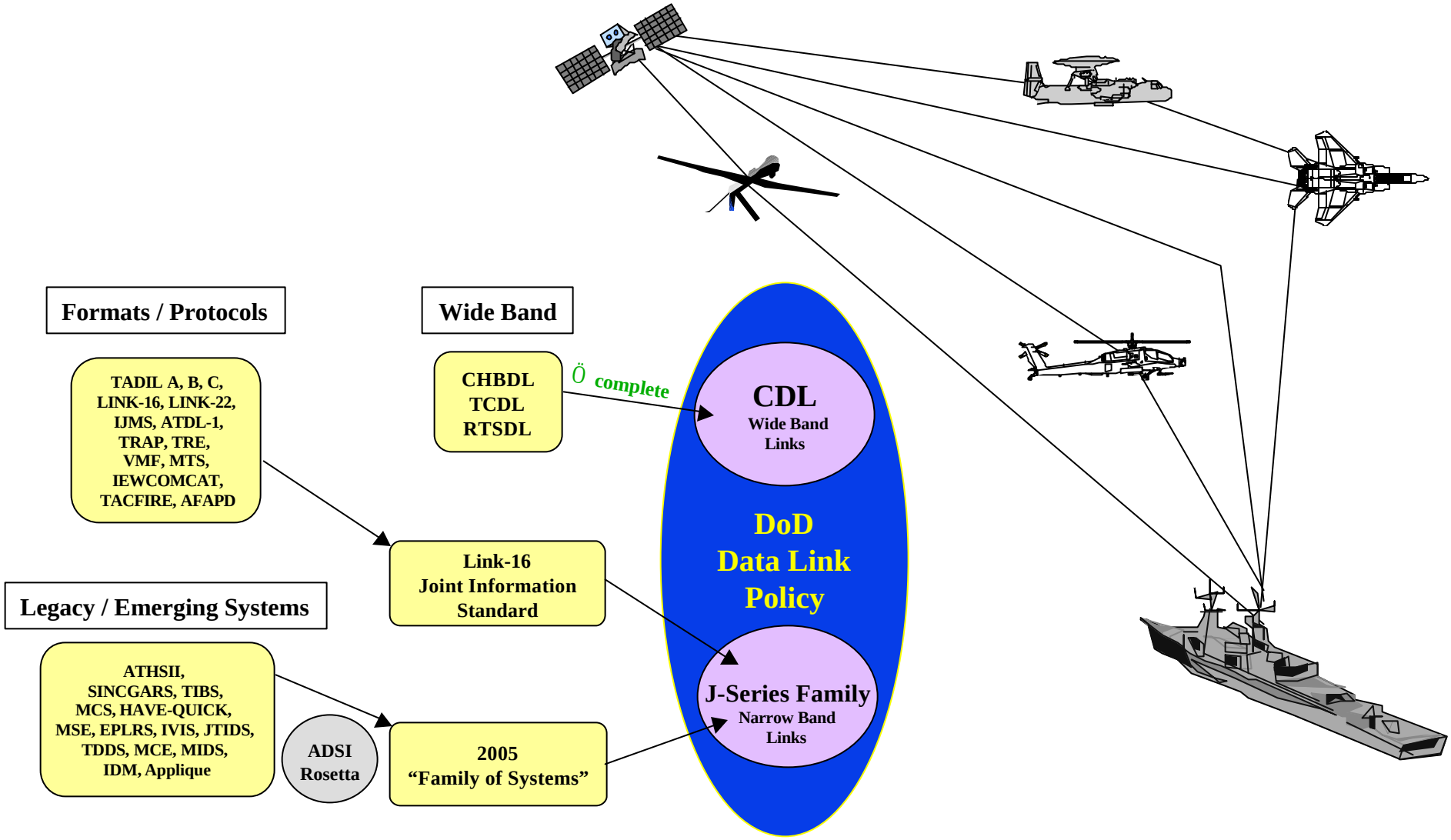
Information - Knowledge



Enablers for C4ISRT

- Building the Networks
  - NMCI
  - IT-21
  - Security & Assurance
  - Data Links
  - Bandwidth
- Intelligence, Surveillance, Reconnaissance and Targeting (ISRT)
  - Space/SATCOM
  - UAVs / TCS
  - Combat ID
  - Integrated Broadcast Service
  - TENCAP Programs
- Building and Sharing the Picture
  - Common Operational Picture
  - GCCS-M

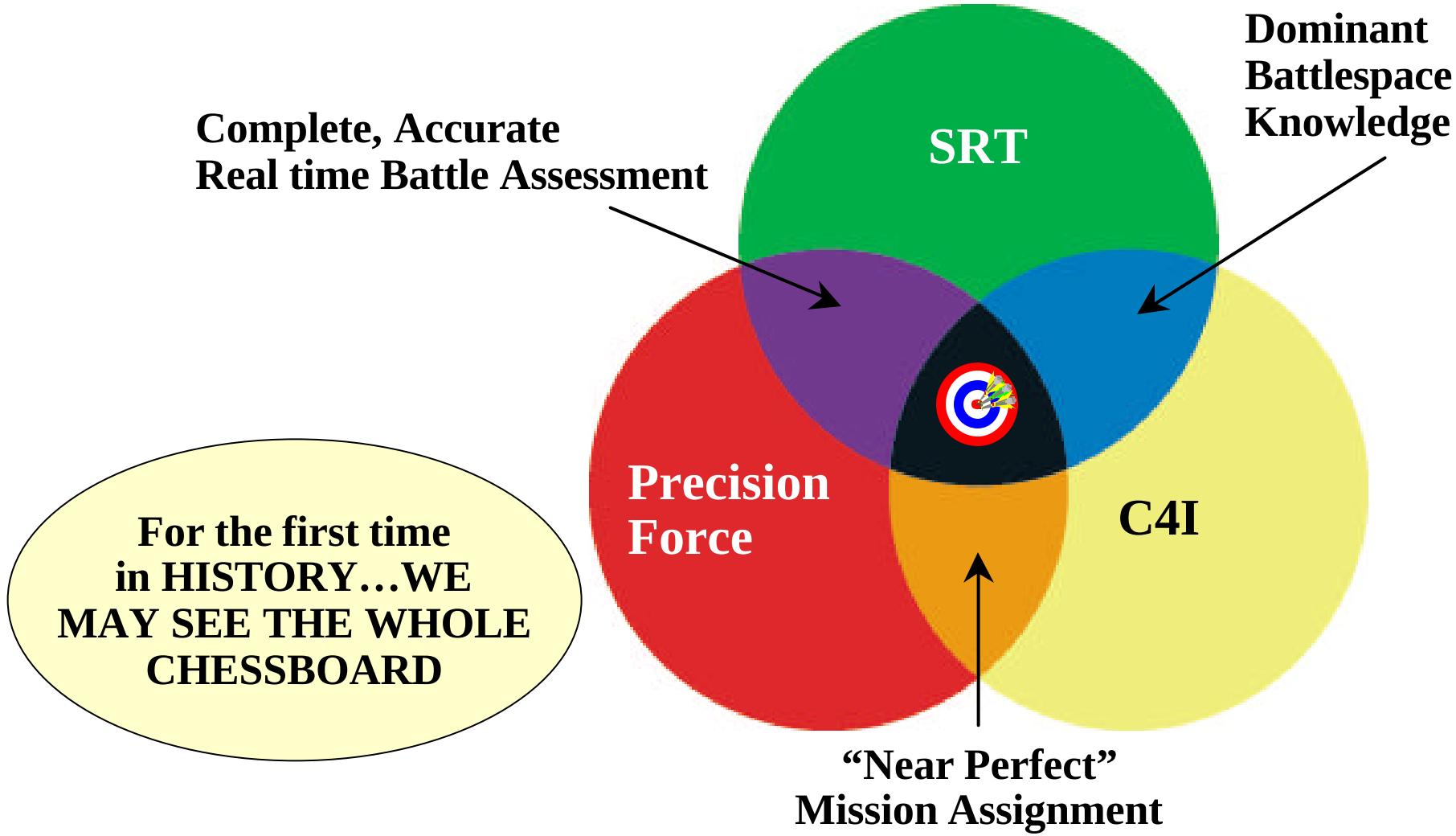
Data Link Migration



Operational Context: Kosovo

- Information Operations
  - Incredible potential…must become our asymmetric "point of main effort"…but not yet understood by war fighters…and classified beyond their access
- Information Technology
  - Information saturation is additive to "the fog of war"
  - The demand for info will always exceed the capability to provide it…how much is enough?
- Leaders, Command and the VTC
  - Ability to shorten decision cycles dramatically
  - Clear and unambiguous Commander's Intent

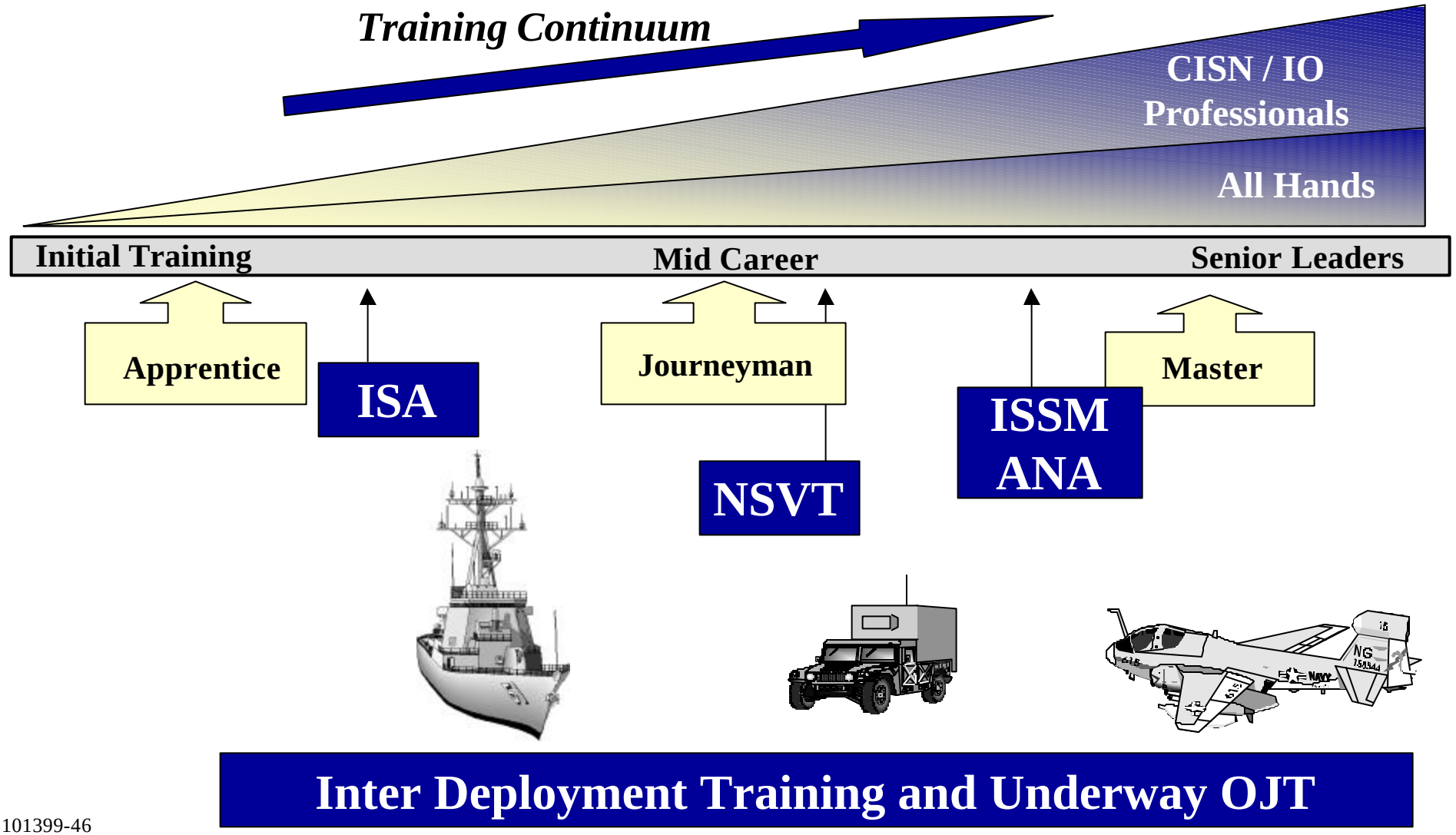
What it Means:
A New System of Systems



Navy Space Today

Naval Missions	Navy Space requirements
• Forward presence • Power projection • Deterrence • Area & Sea dominance	• Space is a National & Joint medium • Space requirements are functional • Mission requirements drive Space solutions • Space S&T enables Space solutions
Space is part of combat system	**Space Strategy**
• Detection, engagement, battle damage assessment • Battle space extension • Precision weapons targeting • Enhanced theater ballistic missile defense	• N63 working closely with N51 • Space Strategy to support "Power, Presence, Knowledge...A Maritime Concept for an Information Age" • Implements Naval Space Policy • Space is critical to Naval missions

Enlisted CISN Training Approach



RM/IT Career Progression

Years of Service	Tour Length	School Length	Career Path	Pay Grade
	3 Yrs		3rd Shore Tour	
	3 Yrs		3rd Sea Tour	
15-16 Yrs		3 Wks	ISSM	E-7
	3 Yrs		2nd Shore Tour	
12-13 Yrs	3-4 Yrs		2nd Sea Tour	
		8 Wks	TSC/NTCSS SYS ADM	E-6
8-9 Yrs		8 Wks	NSVT/ANA	
	3 Yrs		1st Shore Tour	
5 Yrs			ISA School	E-5
	5 Yrs		1st Sea Tour	
		14 Wks	RM 'A' School	
		9 Wks	RTC	E-1

RE-ENLISTMENT INCENTIVES CONTINUE DURING CAREER (Amounts vary depending on time in service, CREO group, etc.)

RE-ENLIST: $25K, 6 YEARS

CTR Career Progression

Years of Service	Tour Length	School Length	Career Path	Pay Grade
	3 Yrs		6th Tour	
	3 Yrs		5th Tour	
15-16 Yrs		3-8 Wks	ISSM/ANA	E-7
12-13 Yrs	3 Yrs		4th Tour	
	3 Yrs		3rd Tour	
		6 Wks	CTR 'C' School	E-6
8-9 Yrs		8 Wks	NSVT	
	3 Yrs		2nd Tour	
5 Yrs		8 Wks	ISA or SYS/NET ADMIN School	E-5
	3 Yrs		1st Tour	
		20 Wks	CTR 'A' School	
		7 Wks	RTC	E-1

RE-ENLISTMENT INCENTIVES CONTINUE DURING CAREER (Amounts vary depending on time in service, CREO group, etc.)

RE-ENLIST: $25K, 6 YEARS FOR ISA SCHOOL

Information Intensive Officer Career Path

06	MAJOR COMMAND	SCHOOL CO'S/NCTAMS CO/CO CDR CMD	+18 YRS
		NCTAMS XO/DET OIC/OPNAV STAFF	
05	STAFF DUTY (JOINT, FLEET, OPNAV)	AFLOAT STAFF/OPNAV/ UNIFIED CINC STAFF IT/IO	17-18 YRS
	INITIAL COMMAND	NDU IO Curriculum (NWC)	15 YRS
04	STAFF DUTY	ACISO /AIWC/GRUCOM/ N6 DESRON/PHIBRON	12 YRS
	XO/AFLOAT STAFF)	NCTAMS/OPSO/SHORE DEPT HEAD- NAVY or JOINT	9 YRS
03	SHORE/STAFF DUTY	INSTRUCTOR@C4I SCHOOL/NCTS or NSG DH	6 YRS
	DEPT HEAD	NPGS – IT or IO curriculum	
01	ADVANCED EDUCATION	COMMO/EMO/EWO/ CIC/SSBN/SECGRU/ INTEL	3 YRS
	DIVISION OFFICER		
	ACCESSION	ACCESSION exposure	0 YRS

Information Operations

At once a great success… and perhaps the greatest failure of the war

- First IO Cell activated at the JTF-level
- All the tools are in place… only a few were used
- Great people… with great access to leadership… but too junior and from the wrong communities to have the required impact on planning and execution
- Incredible potential… must become our asymmetric "point of main effort"… but not yet understood by war fighters… and classified beyond their access

Properly executed, IO could have halved the length of the campaign

Information Technology

Great technology… but needs controls...

- Information saturation is additive to "the fog of war"
- The demand for info will always exceed the capability to provide it… how much is enough?
- You can have too much staff coordination… and for issues that don't require it
- Still need to "push" critical info vice "posting it" on the web page… no substitute for record traffic
- You can only manage from your DTC… you cannot lead from it

Uncontrolled, it will control you and your staffs… and lengthen your decision-cycle times

Leaders, Command, and the VTC

Used properly… a most powerful tool

- Ability to shorten decision cycles dramatically
- Clear and unambiguous Commander's Intent
- Obviates need for key commanders to be co-located

Used improperly...

- A voracious consumer of leadership and key staff working hours… the trend towards glitzy graphics
- No substitute for campaign planning and written orders
- Subject to misinterpretation as key guidance is filtered down to lower staff levels
- Enables senior leadership to sink to past comfort levels… discipline is required to remain at the appropriate level of engagement and command

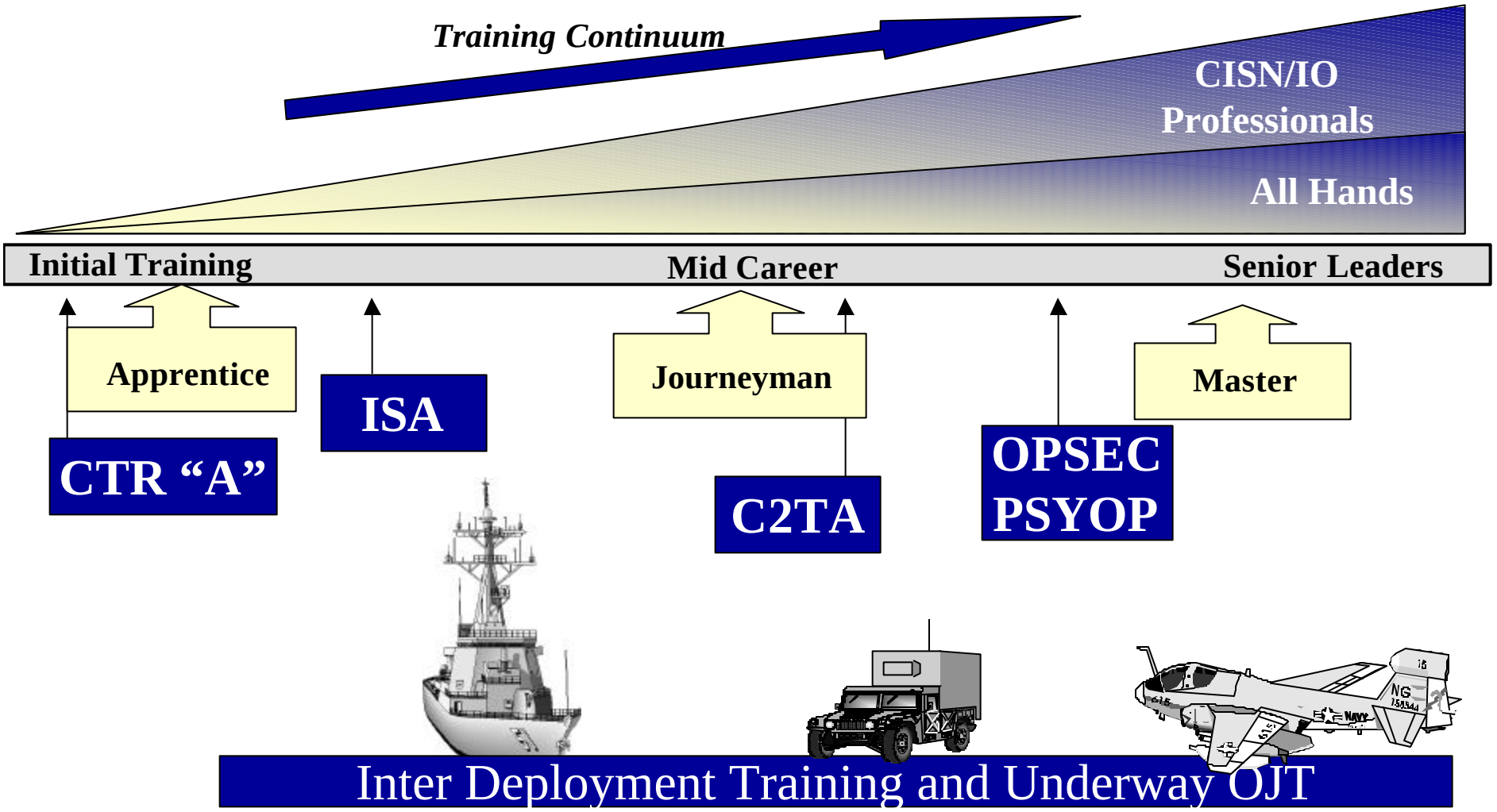
Final Thoughts

We succeeded. But what if...

- The enemy had attacked front line allies with ground forces… or theater ballistic missiles?
- The enemy had gotten even a few POWs… or KIAs?
- Invasion became the only option?
- The FRY submarine had sortied?
- We were still fighting in winter weather?
- We'd expended our precision munitions stocks?
- Public support had weakened or evaporated?
- France… or Italy (bed down)… had said "enough"?
- North Korea or Iraq had attacked?

We don't know until the next time

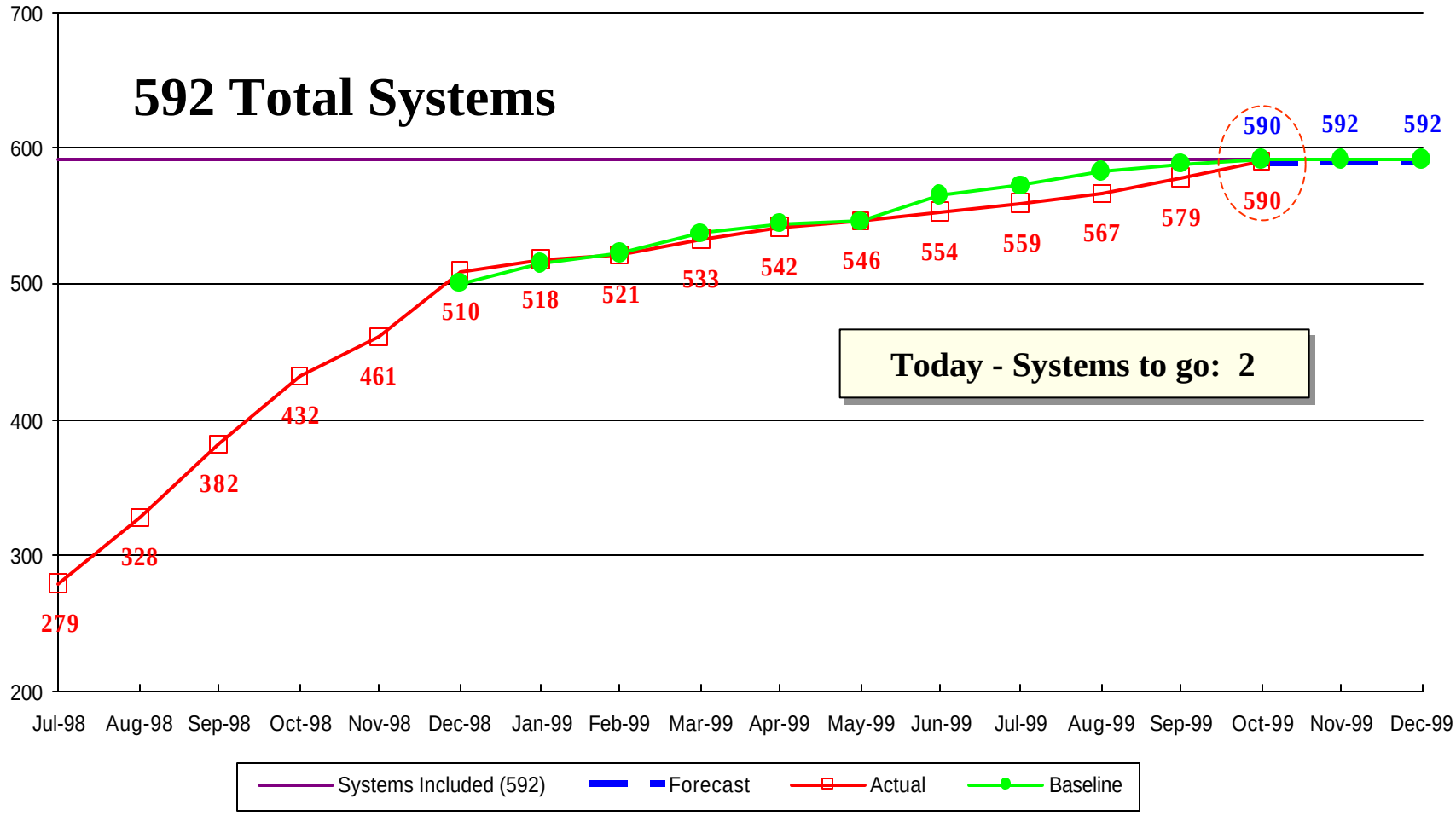
Enlisted IO Training Approach



MIDS-LVT

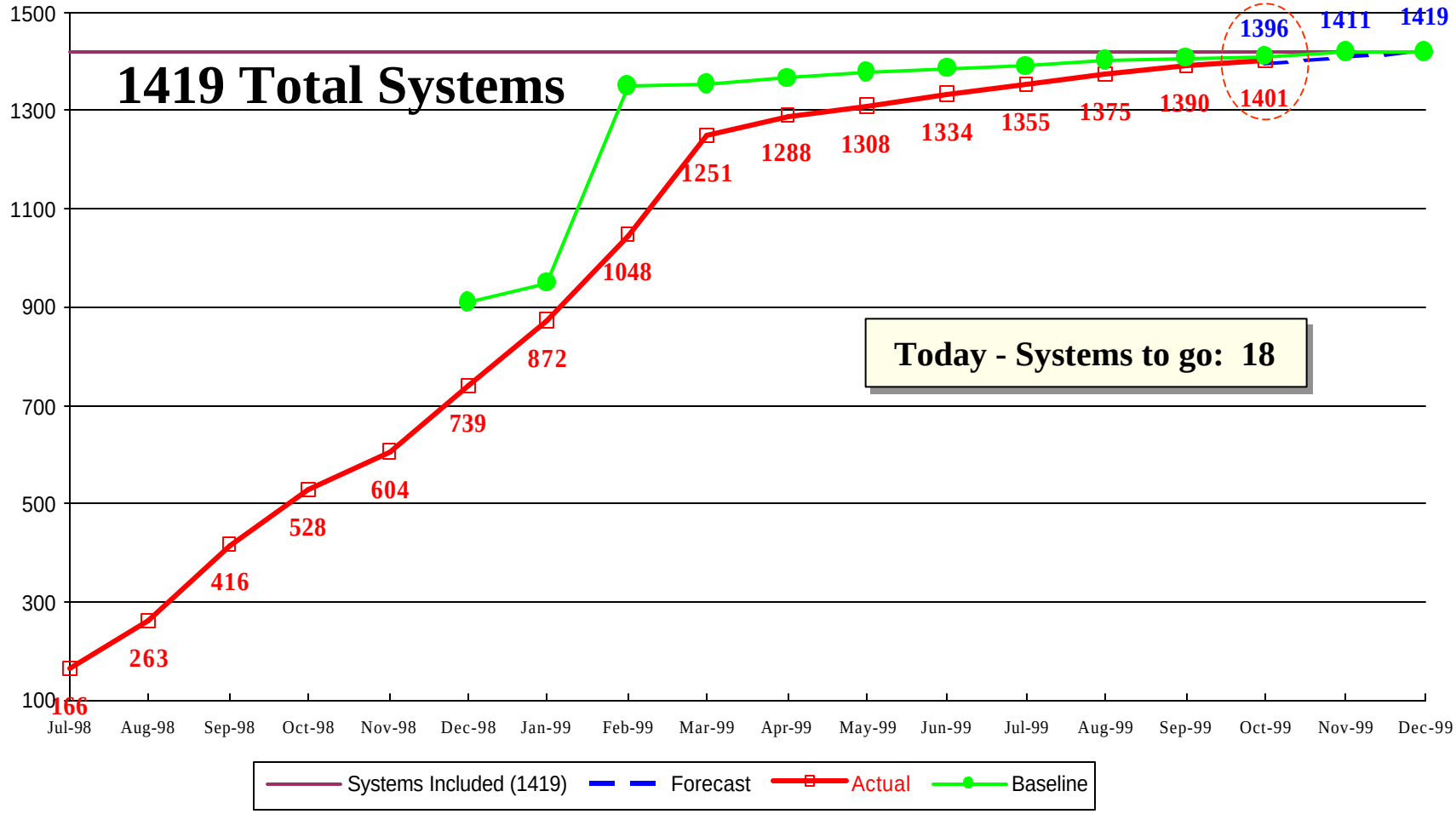

CAUTION
J11
J10
J9
J8
J7
J6
J12
J5
J14
J3
J2
J4
J13
J1
GND
J3
J1
J2
J4
BATTERY COMPARTMENT

Navy Mission Critical Systems Completion Chart



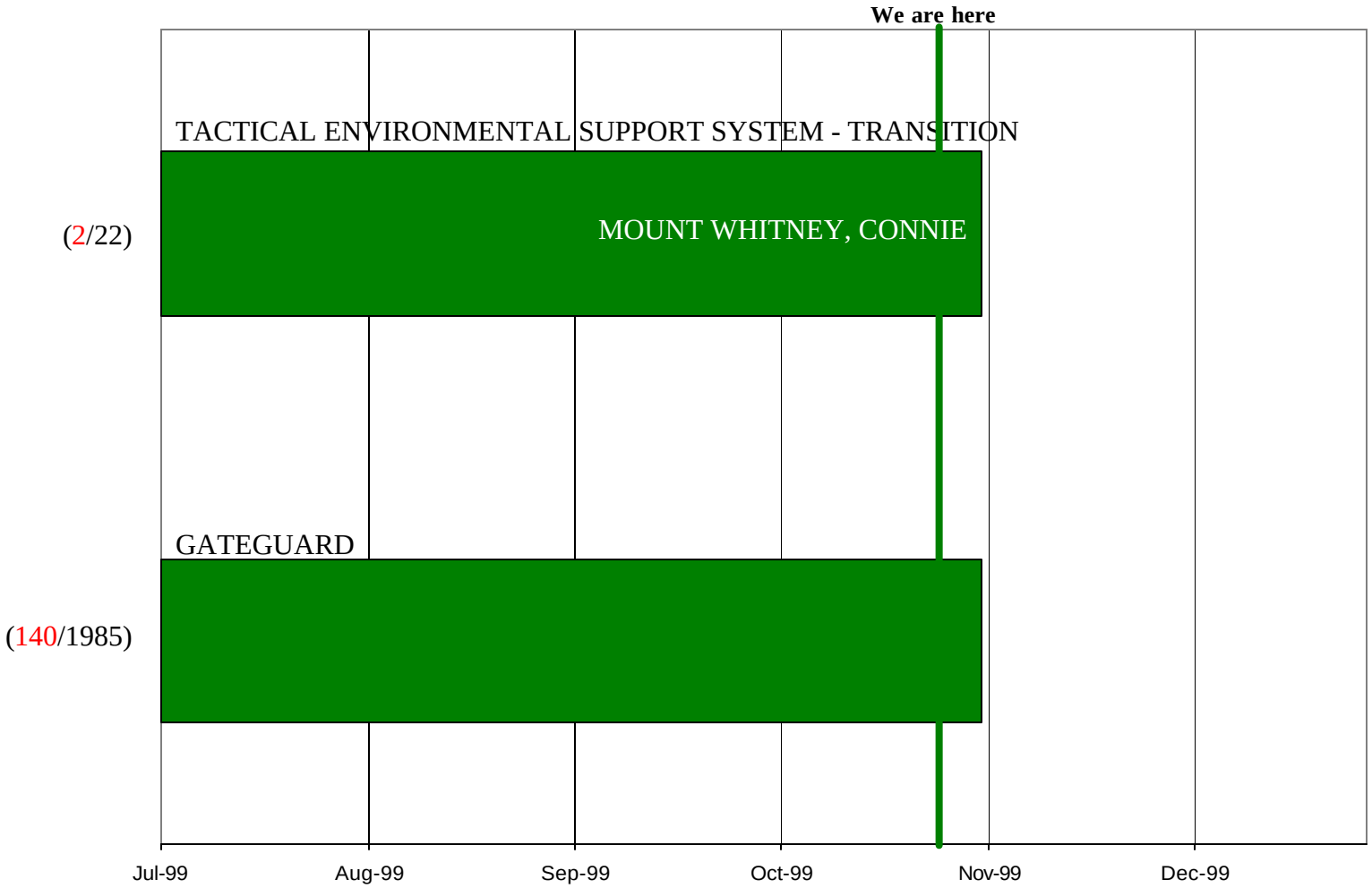
Database as of 10/25/1999, without INTEL
Excluding Dev (1), Dev (2), Terminated/Retired and Replacement

Navy Non Mission Critical Systems Completion Chart



Database as of 10/25/1999, without INTEL
Excluding Dev (1), Dev (2), Terminated/Retired and Replacement

Mission Critical Systems Not Completed



(RED = # remaining)
Data as of: 27 Oct 1999